SICURIT P/N: IMN230RS - MESDAVE200RS

Doc. SBS – IMN230RS - MESDAVE200RS

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DIGITAL
IMN230RS
MESDAVE200RS
MW

SICURIT
PERIMETER PROTECTION SYSTEMS

CE

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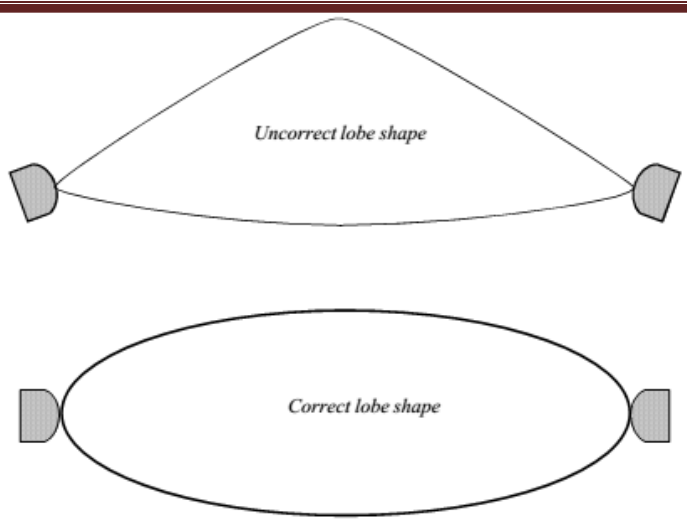
SECTION 1 : GENERIC MICROWAVE INSTALLATION VADEMECUM

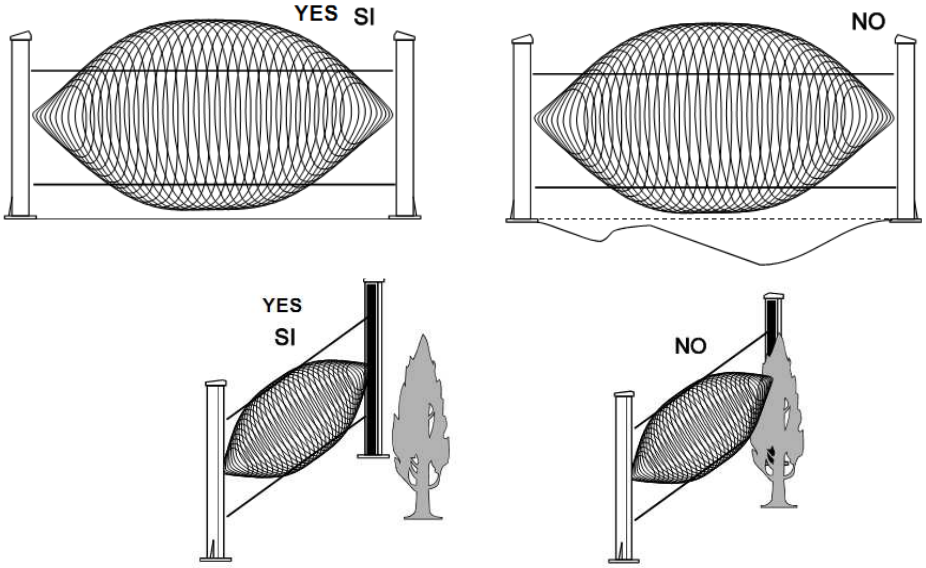
1. GENERIC INSTALLATION INSTRUCTIONS

Position the appliance in a sufficiently open area, strategically optimal for the protection of the site. Local conditions must be thoroughly evaluated so that the zone to be protected by the dual technology sensor in question is free from obstacles like walls, fences and ditches or other systems of anti-intrusion surveillance.

During the installation phase it is necessary to take great care in the alignment of the transmitter and receiver.
An inadequate alignment means, other than a decrease in the signal received (a microwave installed at 100m which is badly aligned would result as if it was installed at a much greater distance), an alteration in the microwave's sensitive zone (lobe).
A correctly aligned microwave tract results in a lobe which is symmetrical to its axis and regular in shape (see figure below).



The installation site must be chosen in such a way that the transmitters and receivers are on the same level. Installation in sites with significant terrain irregularities must be avoided. If this is not done there may be blind zones for the microwaves and infrared signals, through which an intruder could find his way in. A lobe's asymmetry may be due to many things, for example, alignment, the presence of obstacles or the presence of reflecting elements along the tract.

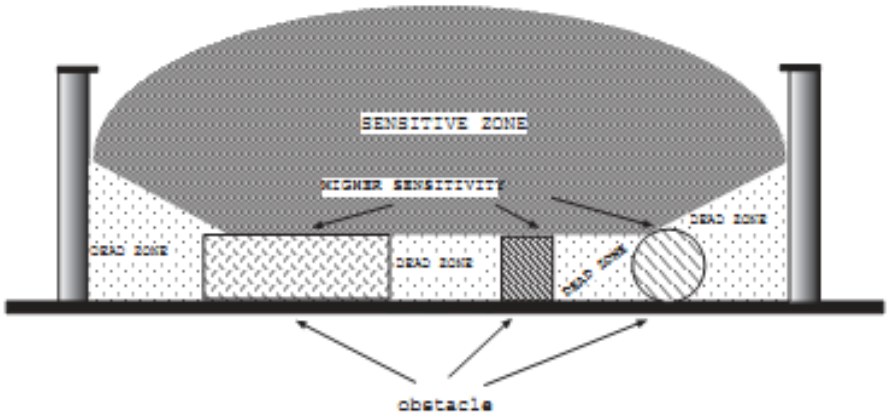


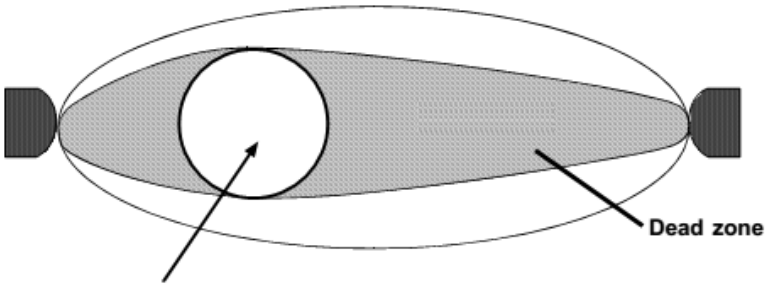
2. TYPICAL INSTALLATION PROBLEMS

The most typical environmental problems that could damage the correct functioning of the microwave are of 3 kinds :

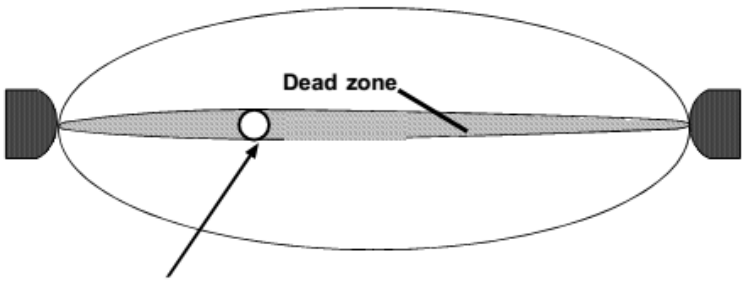
1) Obstacle presence in the sector
2) Metallic fences along the sector
3) Water presence in the senstive zone.

Every kind of fix obstacle that is located in the microwave working area determines a sensible zone alteration, causing dead zones (no possibility of detection) or more and/or less sensitive zones. Another important factor for the dead zones, apart of object dimensions, is the material of what the object is made. There are some kind of materials that determines reflections or absorbing of the signal, or other zone of signal darkening. Be careful at the position, related to the central axis of the sector, of metallic fences that could create interferences to the correct microwave work.



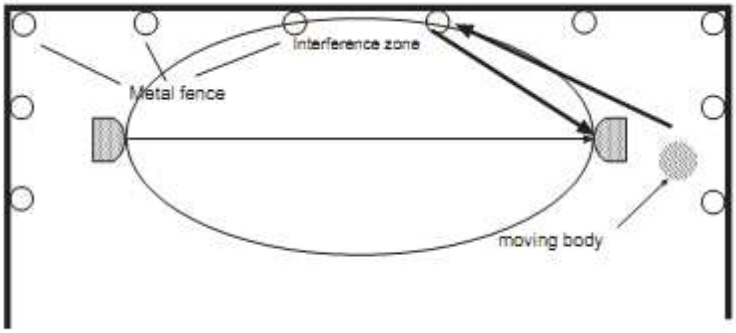


Big obstacle near the apparatus



Little obstacle

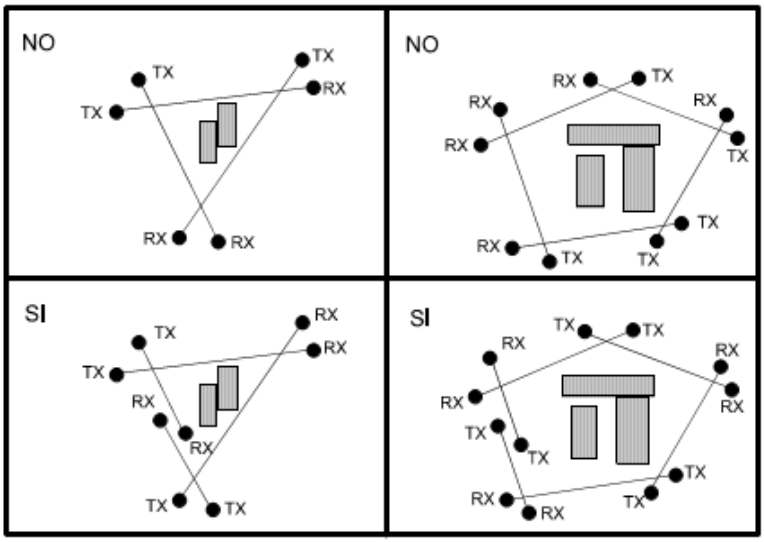
To prevent that those reflections or fence movements will cause false alarms, put the two units TX and RX in a way that the lobo will not interfere with the fence. Metal fences could also generate loss of signal of the microwave, working as an antenna and changing the characteristics of the microwave lobo.

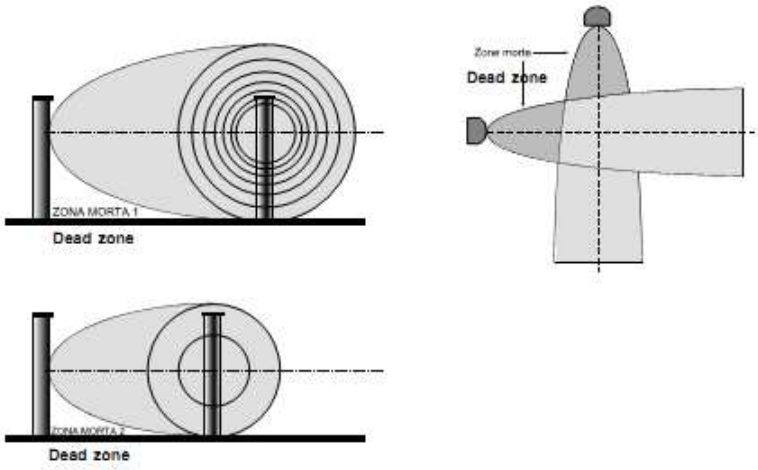


Every kind of water (fix or in movement) create the opposite problem of fence's one. Indeed it causes reflection of the signal, making the signal itself more powerful. That means that in the area could be more signal as necessary, causing more problems to cut the signal during the crossing attemps (as if there was set less sensitivity).

3. SECTORS OVERLAP

To solve the problem of the dead zone that microwaves creates immediately behind them is common, if there are more consecutive sectors, to overlap the sectors between themselves. During the overlap is very important to have in the same corner two similar technologies (2 TX or 2 RX), to prevent interferences. If possible, could be a good thing to have on a perimeter an even pair of barriers, to not have a TX-RX corner.





4. CABLING SUGGESTIONS

To realize a good installation, if there's a system using RS485 bus, is suggested to use a twisted and shielded cable to protect the line from external noises (Belden, AWG2 or equivalents). Is it also suggested to lay the bus cables apart from AC power lines (220V or more, present especially in solar power plants), to prevent electromagnetic interferences on the RS485 signals.

SECTION 2 : IMN230RS / MESDAVE200RS DESCRIPTION

1. INTRODUCTION

MESDAVE200RS is an active microwave volumetric barrier for internal and external protection.

Available product models are:

1. IMN230RS — 200 meter range external for IMN200RS, in extruded aluminium
2. IMN230RSD — 200 meters range, Master MW (used in case of 2 MW install in the same column and same direction)
3. IMN230RSS — 200 meters range, Slave MW (used in case of 2 MW install in the Same column and same direction)
4. MESDAVE200RS — 200 meter range digital microwave, in polycarbonate cover for external use
5. MESDAVE120RS — 120 meter range digital microwave, in polycarbonate cover for external use
6. MESDAVE050RS — 50 meter range digital microwave, in polycarbonate cover for external use

2. TECHNICAL SPECIFICATIONS

Power supply voltage	12Vdc ■ 11 ÷ 14.2Vdc ■
Maximum Current Absorbed (double total consumption for D and S type)	115mA per pair ■TX=40mA ■ RX=75mA at 12.5V=
Maximum range	200mt
Emission frequency	In accordance with the directives of each country
Passage time adjustment	10 at 500mS
Selectable channels	4 + 90° antenna polarize
Operating Temperature	-25°C to +75°C
Case	Aluminium Column / Polycarbonate Box
Box Dimension	h=390 x l=280 x p=135mm
Pole dimension	Diam. 48mm – Alt. 800mm

3. FEATURES

3.1. SYSTEM APPARATUS

The IMN230RS/MESDAVE200RS microwave system is composed by a transmitter head and a receiver head, created with digital micro-processor technology, with digital AGC regulation and with input to reduce sensitivity; relay Alarm contact; Open Collector output (O.C.) , and the possibility to calibrate/set manually and/or digital by Davesoft, or through installation and use of MicroDave software, using the CMH9000DAVE product.

3.1.1. CONNECTION OF THE BARRIER TO THE POWER SUPPLY

The board is powered through continuous current at a nominal voltage of 12,5Vd.c. (min. 11.0 V and max. 14.2 V).

To see the power wiring see the dedicated terminal blocks section

3.1.2. CONNECTION OF THE MW TO INTERFACE BOARD

The MW is connected through RS485 to the CMH9000DAVE board. All data are communicating on these wires. The microwave, in case of DaveSoft use, will be connected through the dedicated DaveSoft Cable

3.1.3. SETTING STORE DATA

All of the programming data are recorded on the board and they are recorded in non-volatile memory (EEProm). By DaveSoft or Microdave SW the configuration and programming of MW is very easy to do.

4. PRODUCT DESCRIPTION

4.1.TRANSMITTER

4.1.1. BOARD: TX

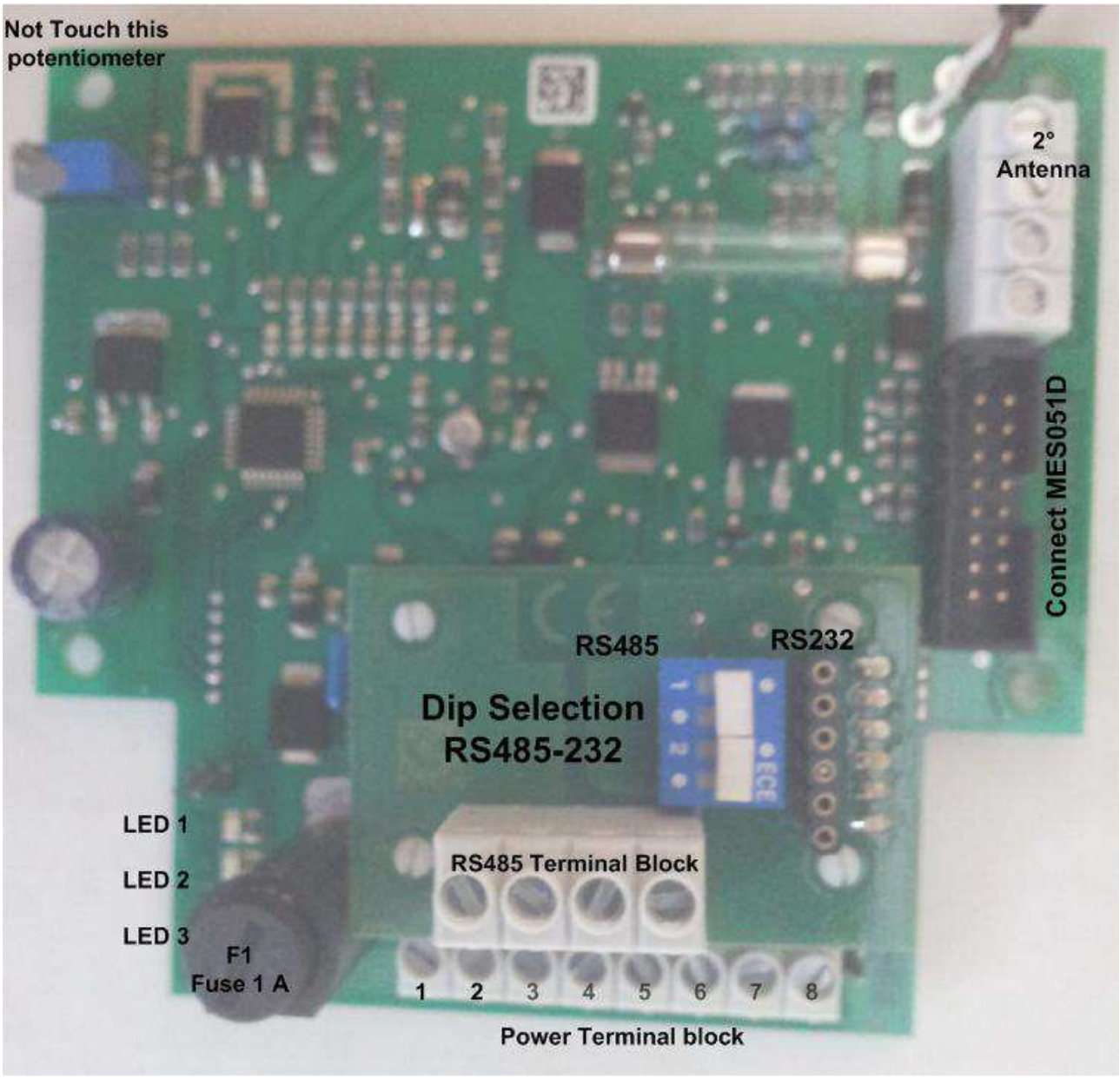


Fig. 1

4.1.2. TERMINAL BLOCK DESCRIPTION

1: (-) Apply the negative power supply voltage to this terminal.

2: (+) Apply the positive power supply voltage to this terminal.

Do not exceed the Min/MAX power supply limits (11.0 - 14.2 V). The nominal value is 12.5 Vd.c.

3: Ext off Reset input through resistance balancing of 3K3Ohm. Value limit +/- 25%. When it is balanced, the transmitter is inactive and does not transmit.

4: Negative reference for reset input

5: Err oc Open Collector output to indicate anomalies. It is possible to connect a relay or LED with a maximum voltage of 20mA. Normally connected to negative.

6: Positive reference for O.C. output voltage

7-8 : Tamp. Anti-opening contact normally closed (for plastic container)

4.1.3. DIP SWITCH FUNCTION

On the TX board there is a 6 positions dip switch, which must have the only dip 1 number selected in ON during the use with Microdave and if there's no RS485 involved. If a CMH9000DAVE is in the system the first four dipswitches sets the RS485 Address :

DIP	1	2	3	4	5	6	7	8
1	ON	OFF	ON	OFF	ON	OFF	ON	OFF
2	OFF	ON	ON	OFF	OFF	ON	ON	OFF
3	OFF	OFF	OFF	ON	ON	ON	ON	OFF
4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON

N.B : Remember, if there are both Microdave and Davesoft, to put only DIP1 in ON during the local setting with Davesoft, then put again the RS485 address

4.1.4. LED FUNCTION

The LEDs on the board have the following functions:

Red LED (1): indicates anomalies with reference to the malfunctioning TX table.

Yellow LED (2): indicates the RS485 communication flowing.

Green LED (3): indicates the presence of the correct power supply value.

Specifications:

L1 LED: (red):	ERR	- flashes,the number of flashes indicates the type of anomaly
L2 LED: (yellow)	Off	- Blinking when the communication with CMH9000DAVE is active, stay on when RS485 is blocked
L3 LED: (green)	PWR	- Lights ON when the TX system is powered with the correct voltage. Turns off when the input supply voltage is too low.

4.1.5. TX FAULT TABLE

Flashes Number

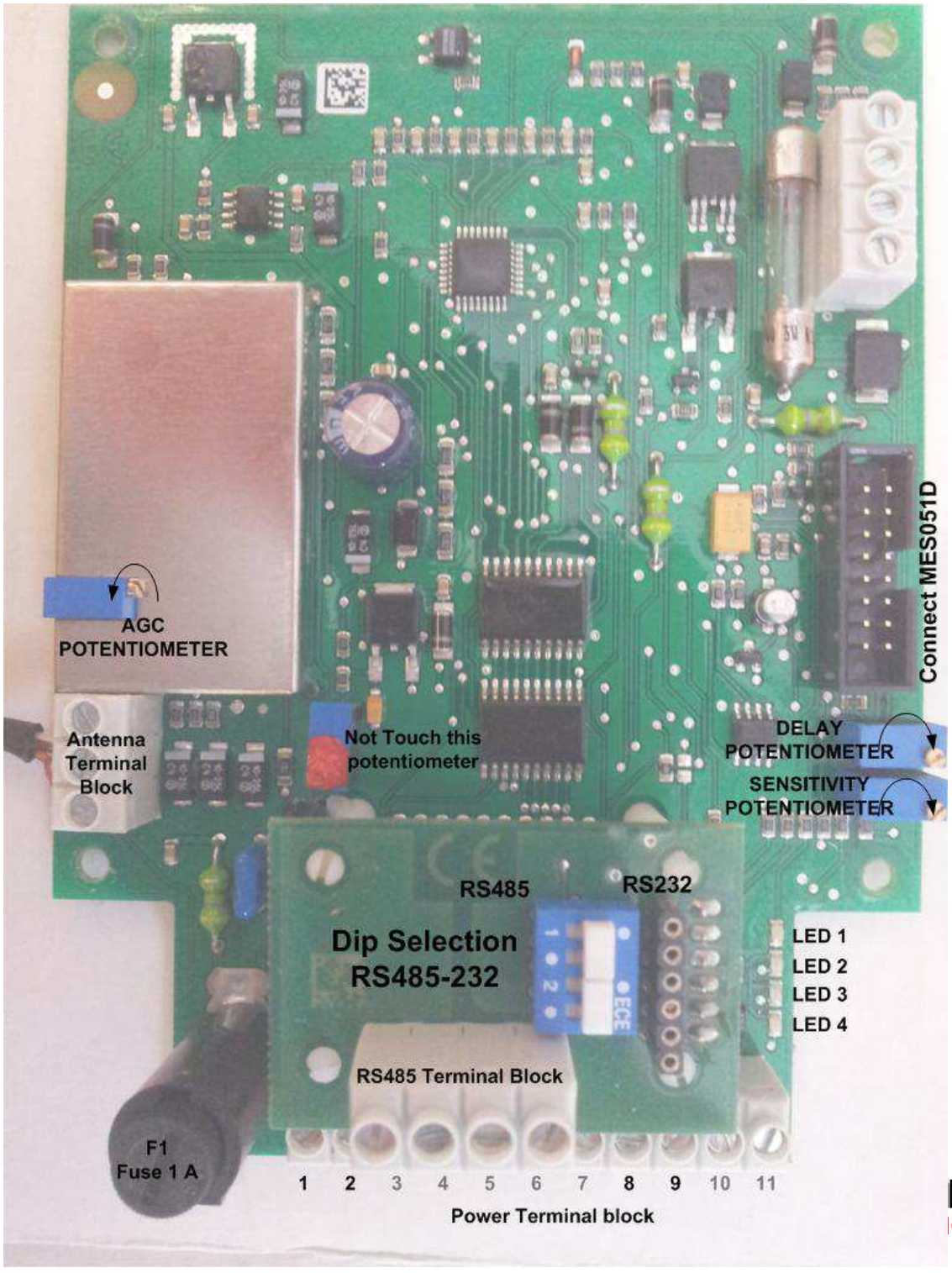
L1 RED	***Type of error***
0	
(led Off)	No error
1 or 2	Main cavity (1) defective
3	Voltage regulated by the cavity command incorrect
4	Vp/p cavity command voltage incorrect
5	Battery low or missing (voltage)
6	Power supply voltage not within tolerance limits (<11 - >14.5Vdc)
8	Processor temperature incorrect (<-30 - >70°C)
9	Secondary cavity (2) defective (only for IMN200RS version)
10	Secondary cavity (2) short circuiting, not connected or absorbing at high levels (only for IMN200RS version)

With regards to indication of cavity problems (flashing 1 or 2), check the correct set up based on the number of connected cavities, normally factory installed with only one cavity connected (Dip 6=Off / Microdave-Davesoft Settings).

Warning: is possible that more than one anomaly could occur at the same time. In this case, the LED, that indicates the type of error, flashing differently after each pause. The fault indication is showed in sequence.

4.2.RECEIVER

4.2.1. BOARD: RX



4.2.2. TERMINAL BLOCK DESCRIPTION

1: (-) Apply the power supply negative voltage to this terminal.

2: (+) Apply the power supply positive voltage to this terminal, not exceeding the MIN/MAX power supply limits (11 - 14.2 V). The nominal value is 12.5 V.

3: Positive reference for output voltage O.C. (12V-20mA)

4: Open Collector output to indicate anomalies. It is possible to connect a relay or LED with a maximum voltage of 50mA. It is normally connected to the negative.

5: Output N.O. alarm relay contact

6: Alarm relay C contact output

7: Alarm relay N.C. contact output

8: Sens Disqualified input through resistance balancing of 3K3Ohm. Value limit +/- 25%.

9: Negative reference for disqualified input

10/11-Tamper Contact - N.C. tamper (for plastic container)

JUMPER FUNCTION
Jumper 1: normally closed. If a R=10Kohm is opened, it is in series with the tamper contact, for anti-intrusion systems with balanced input.
Jumper 2: normally closed. If a R=10Kohm is opened, it is in series with the alarm relay contact, for anti-intrusion control systems with balanced inputs.

4.2.3. DIP SWITCH FUNCTIONS

On the receiving board there is a 10-position dip switch usable with the following settings (in case of absence of RS485 communication) :

DIP	**Function**	Selection
1	Address bit (value=1 - less significant)	Always ON
2	Address bit (value=2)	Always Off
3	Address bit (value=4)	Always Off
4	Address bit (value=8 - more significant)	Always Off
5	Store analogical setting	Always Off
6	Simulate alarm - trigger alarm relay – LED alarm on	Always Off
7	Test mode: for alignment	Always Off
8	Disqualify Input	Always Off (Set ON in second MW IMN230D, Not used in MesDave)
9	Not function	Always Off
10	Battery control	On in presence of battery

In presence of RS485 communication the first four dipswitches changes in base of microwave address, as in the following table.

DIP	1	2	3	4	5	6	7	8
1	ON	OFF	ON	OFF	ON	OFF	ON	OFF
2	OFF	ON	ON	OFF	OFF	ON	ON	OFF
3	OFF	OFF	OFF	ON	ON	ON	ON	OFF
4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON

N.B : Remember, if there are both Microdave and Davesoft, to put only DIP1 in ON during the local setting with Davesoft, then put again the RS485 address

Red LED (1): indicates anomalies with reference to the malfunctioning TX table.

Yellow LED (2): indicates the RS485 communication flowing.

Green LED (3): indicates the presence of the correct power supply value.

Specifications:

L2 LED: (yellow) Off -

L3 LED: (green) PWR - Lights ON when the TX system is powered with the correct voltage. Turns off when the input supply voltage is too low.

4.2.4. LED FUNCTION:

The LEDs on the board have the following functions:

Red LED: Indicates the type of malfunction

Yellow LED: Indicate a wrong channel selection with slow flashing, constantly illuminated for a lack of channel frequency decoding or interference. If there's RS485 connected Blinking when the communication with CMH9000DAVE is active, stay on when RS485 is blocked

Green LED: Indicates the presence of a power supply.

- Lit up when the RX system is powered at the correct voltage.
- Off when the voltage is outside of the tolerance -- 11<V>14.2

Red LED: Indicate an Alarm , flashing indicates an active disqualified input (reduced sensibility, according to the criteria indicated in the section "Disqualified Input").

LED 1 (red-malfunction) indicates the error code according to the blink and the table below listed:

4.2.5. TROUBLE TABLE

Flashes		
0 (led turned off)	No malfunction	
3	DC level error in the amplifier	
6	Power supply voltage not within tolerance limits (<11 - >14.5Vdc)	
8	Processor temperature incorrect (<-30 - >70°C)	

ALARM RELAY

Normally excited when idle (positive security) with contacts free of charge in exchange C NC NO.

OC OUTPUTFAULT

Output normally connected to negative: it opens when one or more malfunctions are found from the table above (RX Malfunction Table) or when the disqualified input is active. Maximum current that can be piloted 20mAdc.

4.2.6. Low Sensitivity Input

When this input is activated the sensitivity and the intrusion passage time are reduced, as specified below.

Activation is indicated by intermittent flashing of LED 4 of the alarm (red).

Input activated generates an automatically adapt of delay time and sensitivity on the MW system IMN230Rx:

- Speed detection (Delay Time)

If the delay time is programmed under 80mS, when the disqualified input is activated, the delay time will be automatically set to 80mS.

A delay time value programmed upper of 80mS, will not be changed when the disqualification input is activated.

- Mass detection (Sensitivity)

If the sensitivity value is programmed with a value higher than 60%, when the disqualified input is active, it will be set automatically to a sensitivity of 60%.

If the sensitivity value is less than 60%,, when the Disqualified input is activated, a sensitivity value of 30% will be automatically selected.

If this input is enabled (connected), check the efficient of intrusion detection in the sensitive area, with input activated.

5. ANTENNA POLARIZE

In some installation the site needs a configuration with more than 2 pairs of system in straight line (more than 2 in sequence and in axis). To prevent any interference trouble, the antenna of MW must be reverse polarize every 2 couples. The reverse polarize (vertical) must be done on both heads, transmitter and receiver.

To reverse the antenna polarization proceed as indicated below.

Normally the antenna is horizontally set (normal polarization) as describe in next picture:

Fig. 2

When the installation requires to set the antenna in vertical mode, the manual job to do on the antennas is the following:

- Disconnect the power supply voltage
- Discharge your body form eventually electrical power charge
- Unscrew the 2 screws present on the ring
- Take out the ring
- Take out the parabola (big circular dish)
- Unscrew the 4 screws on the corner of cavity support
- Rotate the antenna/cavity 90° clockwise

- Screws the metallic cavity support
- Inset the dish
- Insert the ring
- Screw the ring by the 2 screws
- Power up the system

Those operations must be done on transmitter and on receiver MW head, each cavity has to be rotated clockwise.

When the antenna of Tx is not in phase with the antenna of own receiver, the maximum distance reachable is approximately 50 meters, but this data is related to the terrain conformation.

6. ALIGNMENT DESCRIPTION

6.1. ALIGNMENT AND ANALOG CALIBRATION

All the calibration operations indicated below should be performed on terrain in optimal conditions, without depressions, without any accumulations of water, rain or other conditions that could invalidate or alter the alignment quality.

All the calibration and settings could also be made from DAVESOFT and Microdave softwares. See the dedicated manuals to see how set and calibrate using those softwares.

The alignment and calibration of the MW must be performed using a normal digital multi-meter, and/or oscilloscope. Take your appropriate instrument (analogical or digital tester) together with the calibration circuit MES051D and proceed with the alignment operation.

To perform the calibration and verify proper circuit function, proceed the following way:

6.2. TRANSMITTER SETTING

- **Set on transmitter**

  - select the appropriate transmission channel by Davesoft or Microdave SW
  - select the Transmitter ON = active

6.2.1. MULTIMETER TEST (D.C. VOLTAGE) ON FIELD

This procedure is an analogical test and it has to be execute if Davesoft and Microdave SW doesn't show the correct data.

First hardware check is to verify that the green Led always ON . The red LED must be OFF (unlighted). The yellow LED must blink to indicate the running data communication on the RS485.

- Connect the black probe (negative) of the multi-meter to terminal **1** and maintain it in this position for all time of the test.

6.2.1.1. POWER VOLTAGE SUPPLY CHECK

Connect the red probe of the multi-meter to terminal **2**.

The voltage read on the multi-meter must be 12.5 V ± 15 %.

If the voltage differs from the above indicated values, verify the power supply voltage of the TX.

6.2.1.2. INTERNAL LOGICAL VOLTAGE SUPPLY CHECK

Connect the red probe of the multi-meter to terminal **3**.

The voltage read on the multi-meter must be 3.3 V ± 5 %.

If the voltage differs from above indicated values, this means that the internal voltage regulator on the TX circuit is defective.

6.2.1.3. CAVITY VOLTAGE DRIVER

Connect the red probe of the multi-meter to terminal **4**.

The voltage read on the multi-meter must be 9.5 V ± 5 %.

If the voltage differs from above indicated values, this means the control voltage regulated in factory for the emitter cavity, it is incorrect.

In case that you have an oscilloscope, proceed to these additional tests:

6.2.2. OSCILLOSCOPE TESTS

Connect the oscilloscope reference (negative) to terminal 1 or to the apposite test point present on the MES051D board, and leave it in this position for all time needed for the test.

6.2.3. CAVITY WAVEFORM DRIVER

Connect the oscilloscope probe to terminal **5**

This terminal show a square waveform of approx. 3Vp/p and a frequency equal to that of the channel selected, as indicated in the associated table.

Channel	Frequency
Ch 1	900Hz
Ch 2	1160Hz
Ch 3	1500Hz
Ch 4	2400Hz

Connect the oscilloscope probe to terminal **6**

This terminal has a square waveform of approx. 9.5Vp/p and a frequency equal to that of the channel selected, as indicated in the associated table.

Connect the oscilloscope probe to terminal **7**

This terminal has a square waveform of approx. 9Vp/p and a frequency equal to that of the channel selected, as indicated in the associated table. It is the control voltage of the main cavity.

Connect the oscilloscope probe to terminal **8**

This measure is valid only in the presence of two connected cavities.

This terminal has a square waveform of approx. 9Vp/p and a frequency equal to that of the channel selected, as indicated in the associated table. It is the control voltage of the secondary cavity (when present)**.**

If all of the operations and settings are correct and the transmitter is in service, only the green LED should be lit up.

6.3.RECEIVER TEST AND ALIGNAMENT

All the following checks in analogical mode could be avoid if the data are displayed on the Davesoft or Microdave SW are correct.

6.3.1. RECEIVER SETTING

All the calibration could also be made from DaveSoft and Microdave software. See the dedicated manuals to see how set and calibrate using those softwares. For the settings the only allowed way to proceed is to use Davesoft or Microdave.

- Set on receiver by Davesoft or Microdave software
  - select the appropriate transmission channel (according with Tx channel selection)
  - verify that the green LED lights up indicating proper 12Vdc power supply
  - perform the connection between the RX DIAGNOSTIC connector and the MES051D board.

6.3.2. MULTI-METER TEST (D.C. VOLTAGE POWER SUPPLY CHECK)

Connect the black probe (negative) of the multi-meter to terminal **1** and maintain it in this position for the entire duration of the test.
Connect the red probe of the multi-meter to terminal **2**.

The voltage read on the multi-meter must be 12.5 V ± 15 %.

If the voltage differs from the above indicated values, verify the power supply voltage of the RX.

6.3.3. INTERNAL LOGICAL VOLTAGE SUPPLY CHECK

Connect the red probe of the multi-meter to terminal **3**.

The voltage read on the multi-meter must be 3.3 V ± 5 %.

If the voltage differs from that above indicated, this means that the internal voltage regulator on the RX circuit is defective.

6.3.4. SENSITIVITY ADJUSTMENT

This parameter could be set only by Davesoft or Microdave SW
The value read on Microdave or Davesoft SW menu has to be between 1% and 99% (99% is maximum value readable = bad alignment).
Digit a value of 50% on the sensitivity to set a medium sensitivity capability.
Select 50%, by obtain average sensitivity, normally this value of sensitivity is enough to detect a human intrusion. We recommended to adjust the value at the proper sensitivity and normally between 40% to 90% maximum.

10% indicates the minimum sensitivity (only big object like a big truck will be detected) and a theoretically value 95% indicates the maximum sensitivity (small object is detected like a bird).

6.3.5. DELAY ADJUSTMENT

This parameter could be set only by Microdave or Davesoft SW

Adjust the detection value to the following value, approx. 100mS.

The value selected to 100mS corresponds to a delay time, it means that with this value the MW will detect a man that walks fast and not the man that runs.

Indeed, this setting of value indicates the capacity to detect objects that pass through the protected area. The value of 500mS indicates the minimum detection level (e.g. it will not detect a running man). Set at this value, the system is able to detect the intrusion of an objects, that passed the protected zone very slowly.

The adjustment of the sensitivity and speed intrusion , must be regulated on the basis of the needs and installation characteristics and the security of every individual pair.

The data of sensitivity and delay specified in the previous paragraph are necessary during the alignment mode, but the installer must adapt the values based to the real detection capability requested by the security level of installation.

The right values must be set at the end of the alignment. The Microdave or Davesoft SW helps the installer on the correct choose of these 2 important values, refer the instruction manuals of Microdave or Davesoft SW

6.3.6. ALIGNAMENT PROCEDURE (AGC)

Connect the red probe of the multi-meter to terminal **7**.

The voltage read on the multi-meter must be between 0 and 3.3 Volt.

Regulate the calibration trimmer AGC signal on a value of approx. 0.5 volt. Turning counter clockwise increases the voltage value.

Try to move the parabola (discharge your body from electrical charge before operate on MW dish) up and down and after you reach the maximum voltage value, move left and right.

All this operation are actuated to find the maximum radio link power from transmitter to receiver, during the alignment, the operator positioned must be on rear to the column.

The antenna adjustment must be done on receiver head, then on transmitter, and at the end again on receiver . Move slowly the parabola/antenna because the change of AGC is execute very slowly.

Wait for roughly 2 minutes for a non-alarm situation (no passing in the protected area and an AGC signal that is stable at about 20% as previously calibrated).

Move the parabola with slow movements, first horizontally and then vertically, positioning it behind the column as to not influence the detection lobe.

This voltage output indicates the quantity of signals received by the receiver, which indicates the alignment quality. The maximum value indicates the best alignment. To perform the alignment, position yourself behind the receiver and leave the area to be protected.

Do not move in a detection area for at least 2 minutes. After this, verify that the voltage on the voltmeter is higher than 0.2 volts. Then proceed to moving the parabola horizontally in order to optimise the alignment (search for the maximum voltage). Once a value of over 2.8 volts has been reached, adjust the trimmer near the cable input cavity (AGC adjustment trimmer, turn clockwise to reduce the value) until the voltage is reduced to approx. 0.5 volts and then search again both vertically and horizontally for the highest possible voltage. In the case that again obtain a value of over 2.8 volts, repeat the preceding operation, adjusting the trimmer and searching again fro the maximum voltage. Researching the maximum value by horizontal and vertical repositioning of the parabola must be performed on both the TX and RX heads and repeated at the end on the RX head.

At the end of the alignment process, wait for the voltage to stabilize (about 1-2 minutes after the last passage simulation) and calibrate the trimmer near the input antenna so that the voltage read on terminal 7 has a value between 2.5 and 2.7 volts or 15-25% as AGC value on Microdave or Davesoft SW.

6.3.7. ALARM OUTPUT SIGNAL

Connect the red probe of the multi-meter to terminal **6**.

The voltage read on the multi-meter must be between about 0 and 12 Volt.

This output allows monitoring of the system's alarm state. Indeed, the output is usually closed at negative and becomes Open Collector weighted at 12 volt (internal pull-up resistance) when the alarm relay is in alarm conditions. Maximum output current 20mAdc.

With the Microdave or Davesoft SW this Alarm signal can be identify on video screen.

In the case that you have an oscilloscope, proceed with these eventually and not obliged additional tests:

6.3.8. OSCILLOSCOPE TESTS

Connect the oscilloscope reference (negative) to terminal 1 and maintain it in this position for the entire duration of the test.

6.3.9. WAVEFORM SIGNAL DETECTED

Connect the oscilloscope probe to terminal **8**

This terminal has a waveform that indicates the level of correction of the gain. When calibration has been completed as described above, with no obstacles or movement in the area to be protected, the waveform should consist of two half-cycles with greater spaces towards the negative.

Connect the oscilloscope probe to terminal **10**

This terminal has a square waveform of approx. 1.5Vp/p (trapezoidal) and a frequency equal to that of the channel selected, as indicated in the associated table. The waveform should be clean with no defects on the up and down slopes and without crests on the tops and bottoms. The cleaner and more stable this waveform is, the better the detection will be, as well as the linearity and reliability of the system.

6.4. INTRUSION TEST / MAINTENANCE

Simulate intrusion crossing tests in various points on the installation with objects of various dimensions and crossing speed. The simulation of the intrusion type must be according with the detection operation required. For example, if only cars have to be detected be detected, cross the area with a car in order to adjust sensitivity and passage speed to avoid setting of the system with an unnecessarily high sensitivity. Indeed, a system that is calibrated according to the installation needs, will less likely generate undesired alarms. Repeat these steps more than once to verify intrusion detection in various environmental situations.

Detection of intrusion is indicated by the alarm's red LED lighting up.

Verify stability of the system by leaving the detection field free and verifying that neither the red alarm LED or the yellow interference malfunction LED light up (only red LED give this signalization if there’s RS485 connected).

It is important to remember that the delay time (passage speed regulation) operates on the passage speed, while the sensitivity trimmer operates on the mass detected.

If all of the operations are correct and transmitter is in service, only the green LED should be lit up and the yellow blinking for the communication data RS485 (when present).

All datas related to measurements performed during installation should be taken note or save the parameter in a Microdave or Davesoft SW, in order to facilitate future maintenance or repair operations.

Repeat the above described operation including the intrusion alarm tests every 6 months at least.

The maintenance periods depend greatly upon the security level that request the characterises of the installation.

7. MES051D

In the table below, the functions of the alignment tool test system board, are indicated.

TERMINAL	TRANSMITTER	RECEIVER
1	(-) reference	(-) reference
2	+12V Input Power voltage	+12V Input Power voltage
3	+3.3V Microprocessor voltage regulated	+3.3V Microprocessor voltage regulated
4	+9.5V	Sensitivity Calibration: 0 max -3.3Vmin
5	Selected channel waveform	Passage speed detection calibration: 0 max -3.3V min
6	Oscilloscope: Modulated output signal. Tester: 4.75V= average	O.C. alarm output 20mA dc max
7	Oscilloscope: Secondary antenna command signal output Tester: 4.5V= average If the second antenna is connected.	Tester: AGC continuous level output: 3V signal maximum - 0V minimum At the end of the test, adjust to approx. 2.7Vdc
8	Oscilloscope: Primary antenna command signal output Tester: 4.5V= average	Oscilloscope: AGC voltage, for alignment. Towards maximum positive signal, at the end of the test regulate the peek to peek voltage at 2,7V.
9	Not used	Not used
10	Not used	Oscilloscope: Waveform output signal detected.

All of the above described operations relate to the operation of the IMN230 microwave with analogical adjustment.

In case detection and calibration using software and computers are needed, refer to the appropriate manual, were indicate the alignment and verification procedures.

SECTION 3 : DAVESOFT LOCAL DIAGNOSTIC AND SETUP SW

1. 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.

2. 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.

3. PREDISPOSITION

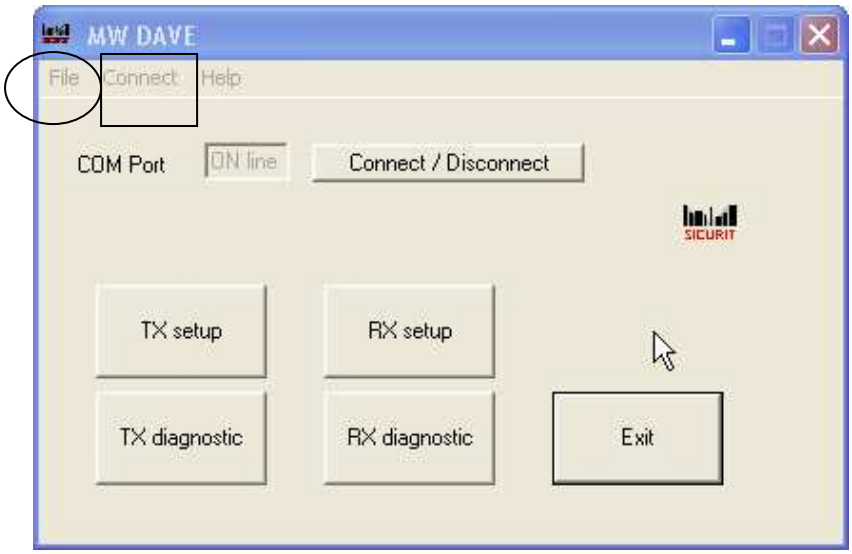
In the CD there are the drivers of the serial USB cable. Proceed at the drivers setup (the file name is CP210x_VCP_Win2K_XP_S2K3, which is located in the subfolder named Cable Drivers) if the USB cable will not be recognized automatically by the PC.

4. 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.

Shown 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

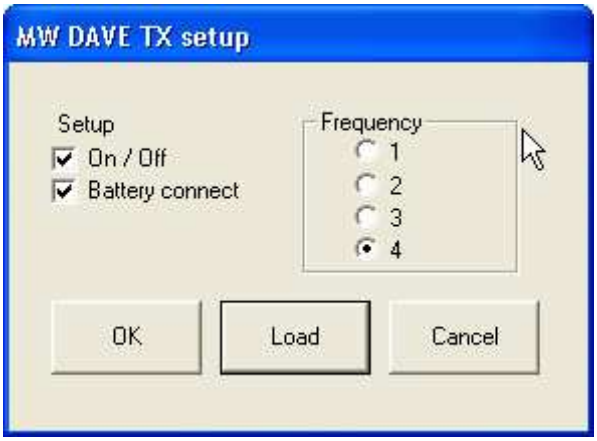
With this software the user can locally control only a unit each time. Select the user Com Port. Connect the cable to the device to program or to see. Push the command Connect from the scrolling menu or push the button 

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

5. 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 frequences must be always different.

The options with √ symbol present are activated.

If √ 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 ●. 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 

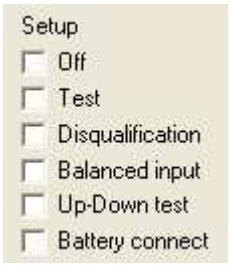
will exit from the setup window without any parameter sending.

6. 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 √ symbol present are activated.

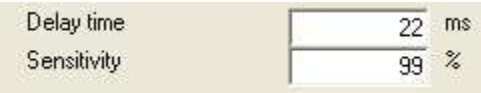


If the √ symbol is not present in the **Off** option the receiver is not active and always in alarm. Theoretically is used to simulate an alarm condition.
If the symbol √ is present on the **Test** option the receiver is in test mode. This mode blocks the AGC functions and permit the microwave alignment. It Is used to align the TX with the RX, as described in the Dave Manual.
If the symbol √ 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 √ 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 √ 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 √ 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 cannel is identified with the black dot ●. To change the setting click with the mouse on the wanted transmission channel.

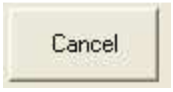
For the selection of the sensitivity and of the delay time, insert the numbers in the relative textboxes



In the **Delay Time** Box select a number from 20 to 500, that represent the time (in ms) of the instrusion 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

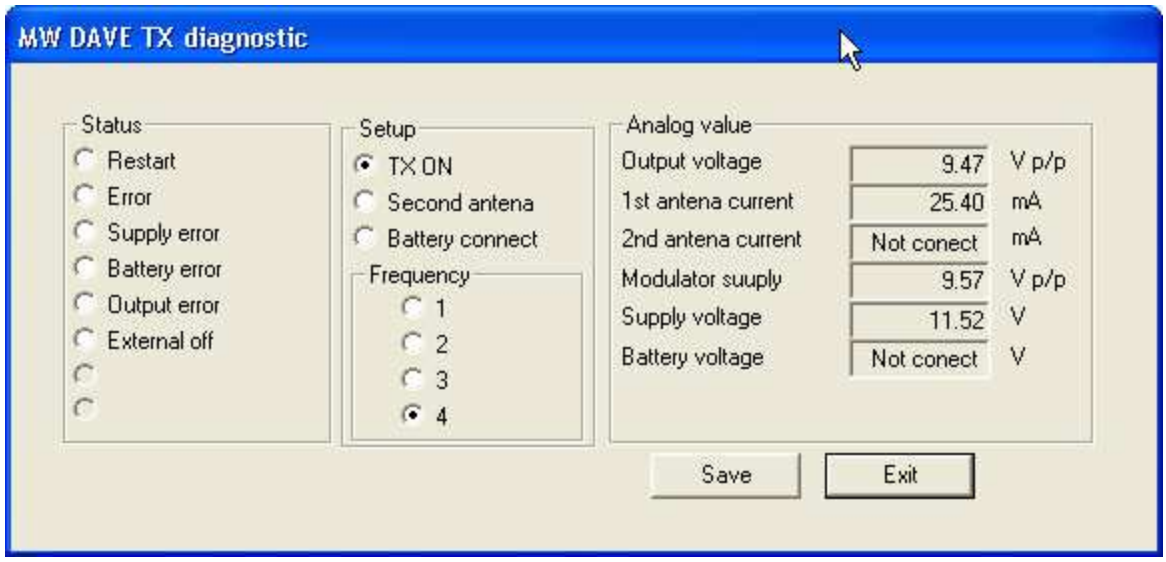
The pushing of 

will exit from the setup window without any parameter sending.

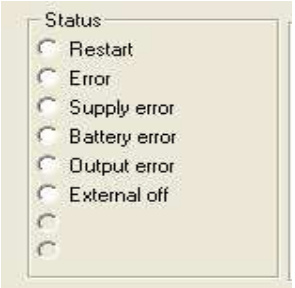
7. TRANSMITTER DIAGNOSTIC

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.

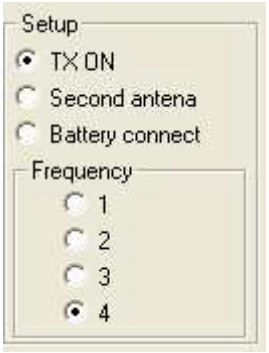
The black dot ● near the **Error** option indicates a generic non good working on the microwave. In this case verify the parameters showed in real time in the Analog value table, and compare them with the correct values of a working microwave or if they are not in the tolerated range (more details on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

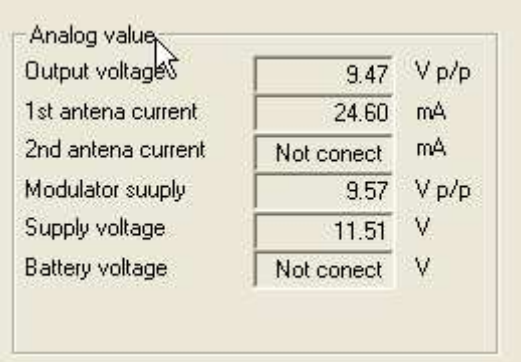
The black dot ● near the **Output error** option indicates a wrong value of the modulator supply. Verify the values from the Analogue table (The correct value is around 9.5V d.c).

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 :

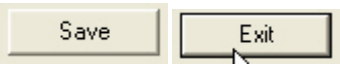


Verify that the stored parameters are the good ones for the installation type. If the user wants to change something go, as previously described, in the "Transmitter settings setup" manual section. In the right section of the diagnostic window there are the following parameters (showed in real time) :

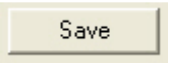


If the read values are correct in the status table the **Error** Option will not result highlighted
The analogic value showed in the **Output Voltage** label must be 9,5V +/-5%
The analogic value showed in the **1st antenna current** label must be 25mA +/-30%
The analogic value showed in the **2nd antenna 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.

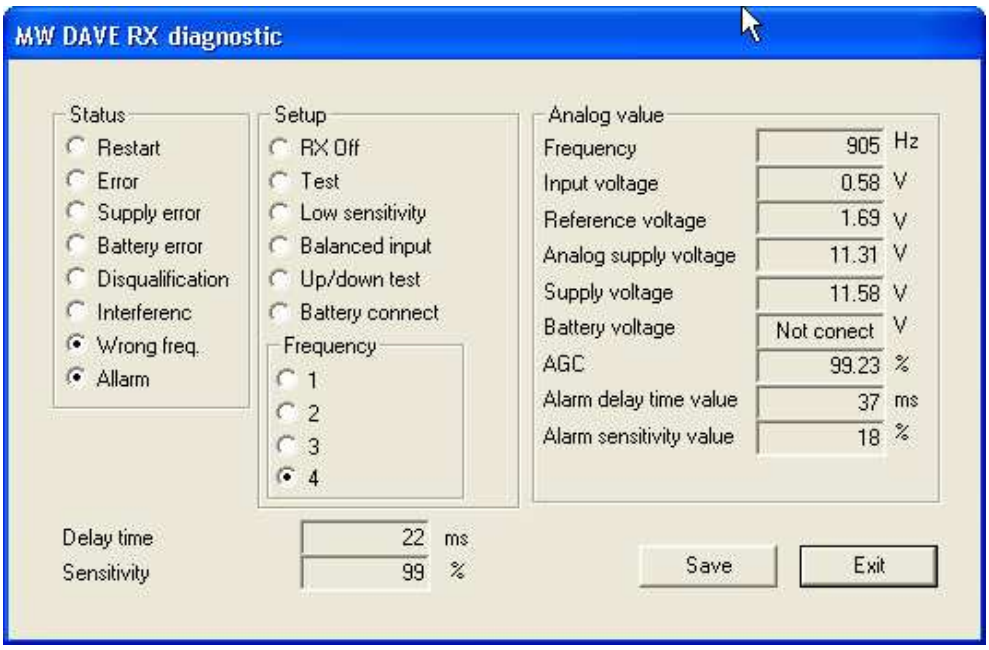
WARNINGS : the storing files must be controlled, to not full the hard disk capacity. In the error storing type, the last error will not be saved if the storing function will be interrupted before the complete data archiving.

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.

8. 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 :

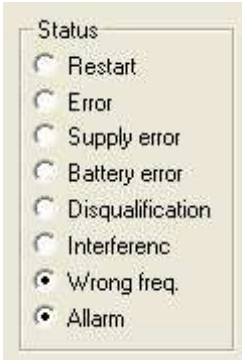


In the left table (named **Status Table**) the black dot ● identify a system trouble. In the status table there are the following conditions :

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).



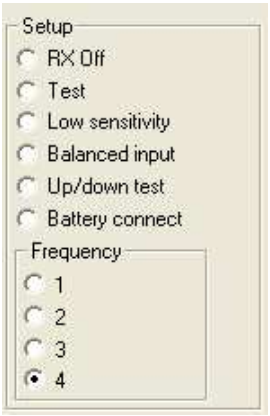
The black dot ● near the **Battery Error** label identifies a supply value of the connected battery out of the correct parameters. In this case verify the battery parameters, and check if they are correct.

The black dot ● near the **Disqualifcation** 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.

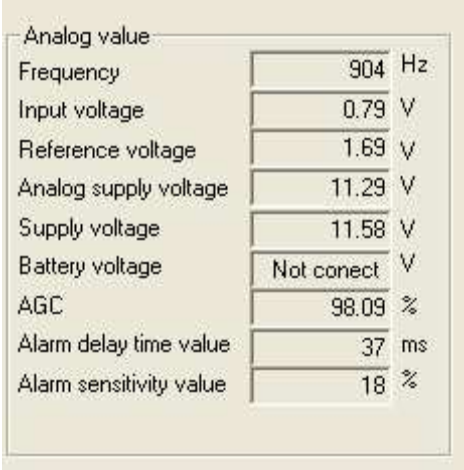
The black dot ● near the **Up Down test** label identifies that this function is in active mode.

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 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.

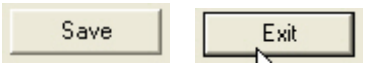
The value showed in the **AGC** label is the most important value for the alignment procedure, because it identifies, for the receiver, the received signal quality. Higher is the AGC, lower is the received signal. At the end of the service tests mode, the AGC must be set (on the AGC trimmer) at the 25%. The trimmer increases the AGC if rotated to le 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 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. I**t's a good thing repeat all the simulations when there is set the definitive time value.**

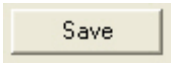
The analog value showed in the **Alarm sensitivity value** label it's important to quantify and set the detection parameters of the mass / object in the sensible area. For any alarm or intrusion this label shows the % value that the object cause on the AGC value. It a good thing to simulate intrusions 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)

I**t'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



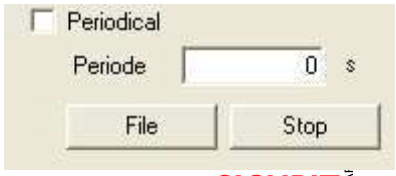
Is possible to activate a new window, where the user could save a text file that contains the analog parameters read by the receiver microwave.

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.

9. ALIGNMENT DESCRIPTION

DIGITAL ALIGNMENT

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%.

10. 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 **Allarm** 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 manteinance of substitution of a device.

11. 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

12. 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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N;0909;0.53;1.67;11.64;N.C.;09.05;00.00;95;0040; 00.00;000042;37;
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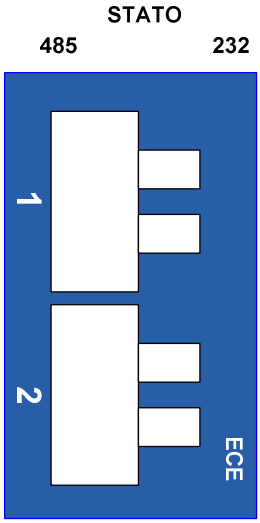
DaveSoft Switch 232/485 scheme

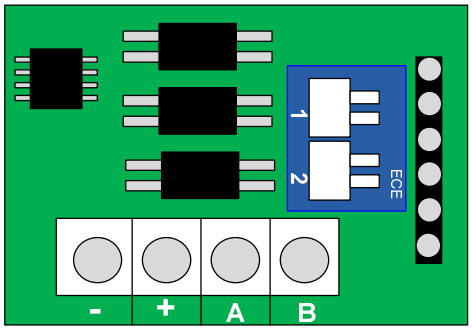


The switch, draw in white and located on the 485 board of the MesDaveSoft, allow to select the type of comunication between the microwave and the remote terminal.

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

- With the two switches shifted on the right, the microwave will comunicate 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.

13. DATA SETTING FEATURE

DATE ……..

Analogical Values

Desciption	Setting value	Note and comment
AGC	…….. Volt …… %	At the end of alignment and in service after few minutes without any alarm, must be set to approximatly 2,7Volts.
Delay	…… Volt …… mS	
Sensitivity	…….. Volt …….. %	
Channel	……	
Disqualified Input	❒ Bilanciato ❒ Normale	
Cavità TX	❒ 1 ❒ 2	

Dip switches setting of transmitter

DIP	1	2	3	4	5	6
ON						
off						

Dip switches setting of receiver

DIP	1	2	3	4	5	6	7	8	9	10
ON										
off										

DATE ……..

Analogical Values

Desciption	Setting value	Note and comment
AGC	…….. Volt …… %	At the end of alignment and in service after few minutes without any alarm, must be set to approximatly 2,7Volts.
Delay	…….. Volt …… mS	
Sensitivity	…….. Volt …….. %	
Channel	……..	
Disqualified Input	❒ Bilanciato ❒ Normale	
Cavità TX	❒ 1 ❒ 2	

Dip switches setting of transmitter

DIP	1	2	3	4	5	6
ON						
off						

Dip switches setting of receiver

DIP	1	2	3	4	5	6	7	8	9	10
ON										
Off										

DATE ……..

Analogical Values

Desciption	Setting value	Note and comment
AGC	…….. Volt …… %	At the end of alignment and in service after few minutes without any alarm, must be set to approximatly 2,7Volts.
Delay	…….. Volt …… mS	
Sensitivity	…….. Volt …….. %	
Channel	……..	
Disqualified Input	❒ Bilanciato ❒ Normale	
Cavità TX	❒ 1 ❒ 2	

Dip switches setting of transmitter

DIP	1	2	3	4	5	6
ON						
off						

Dip switches setting of receiver

DIP	1	2	3	4	5	6	7	8	9	10
ON										
Off										

DATE ……..

Analogical Values

Desciption	Setting value	Note and comment
AGC	…….. Volt …….. %	At the end of alignment and in service after few minutes without any alarm, must be set to approximatly 2,7Volts.
Delay	…….. Volt …….. mS	
Sensitivity	…….. Volt …….. %	
Channel	……..	
Disqualified Input	❒ Bilanciato ❒ Normale	
Cavità TX	❒ 1 ❒ 2	

Dip switches setting of transmitter

DIP	1	2	3	4	5	6
ON						
off						

Dip switches setting of receiver

DIP	1	2	3	4	5	6	7	8	9	10
ON										
Off										

Hereby, SICURIT AlarmItalia Spa, declares that this movement detector “IMN200” is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/CE (Art 3.1a-3.1b-3.2)

WARRANTY

Sicurit Alarmitalia Spa and/or its subsidiaries and/or its affiliates (" the Manufacturer") warrants its products hereinafter referred to as "the Product" or "Products" to be in conformance with its own plans and specifications and to be free of defects in materials and workmanship under normal use and service for a period of twenty-four months from the date of shipment by the Manufacturer. The Manufacturer's obligations shall be limited within the warranty period, at its option, to repair or replace the Product or any part thereof. The Manufacturer shall not be responsible for dismantling and / or reinstallation charges.
To exercise the warranty the Product must be returned to the Manufacturer freight prepaid and insured.

This Warranty does not apply in the following cases:
Improper installation, misuse, failure to follow installation and operating instructions, alteration, abuse, accident or tampering, and repair by anyone other than the Manufacturer.
This warranty is exclusive and expressly in lieu of all other warranties, obligations or liabilities, whether written, oral, express or implied, including any warranty of merchantability or fitness for a particular purpose, or otherwise. In no case shall the Manufacturer be liable to anyone for any consequential or incidental damages for breach of this warranty or any other warranties whatsoever, as aforesaid.

This warranty shall not be modified, varied or extended, and the Manufacturer does not authorize any person to act on its behalf in the modification, variation or extension of this warranty. This warranty shall apply to the Product only. All products, accessories or attachments of others used in conjunction with the Product, including batteries, shall be covered solely by their own warranty, if any. The Manufacturer shall not be liable for any damage or loss whatsoever, whether directly, indirectly, incidentally, consequentially or otherwise, caused by the malfunction of the Product due to products, accessories, or attachments of others, including batteries, used in conjunction with the Products.
The Manufacturer does not represent that the Product may not be compromised and/or circumvented, or that the Product will prevent any death, personal and/or bodily injury and/or damage to property resulting from burglary, robbery, fire or otherwise, or that the Product will in all cases provide adequate warning or protection. User understands that a properly installed and maintained alarm may only reduce the risk of events such as burglary, robbery and fire without warning, but it is not insurance or a guarantee that such will not occur or that there will be no death, personal damage and/or damage to property as a result.

The Manufacturer shall have no liability for any death, personal and/or bodily injury and/or damage to property or other loss whether direct, indirect, incidental, consequential or otherwise, based on a claim that the Product failed to function. However, if the Manufacturer is held liable, whether directly or indirectly, for any loss or damage arising under this limited warranty or otherwise, regardless of cause or origin, the Manufacturer's maximum liability shall not in any case exceed the purchase price of the Product, which shall be fixed as liquidated damages and not as a penalty, and shall be the complete and exclusive remedy against the Manufacturer.

Warning: The user should follow the installation and operation instructions and among other things test the Product and the whole system at least once a week. For various reasons, including, but not limited to, changes in environmental conditions, electric or electronic disruptions and tampering, the Product may not perform as expected. The user is advised to take all necessary precautions for his or her safety and the protection of his or her property.

Thank you to choose SICURIT Product. This product is designed and manufactured with high quality materials which can be recycled and reused.

The symbol  means that the electrical and electronic equipment, at their end-of-life, should be disposed of separately from your household waste and dispose it at your local community waste collection centre.
Please follow your local rules about electronic waste recycle.
This symbol mark and recycle system are applied in the EU (European Directivity WEEE) countries and could be not applied in other areas of the world.

NOTES:

All illustrations and sizes shown in this manual are intended as a guide only and do not form any part of any contract between SICURIT Alarmitalia Spa and its customers.

All specifications and designs shown in this manual are subject to alteration by SICURIT Alarmitalia Spa without notice at anytime.