

S[®] NARDA Safety Test Solutions S.r.I. Socio Unico Sales & Support:

Via Leonardo da Vinci, 21/23 20090 Segrate (MI) - ITALY Tel.: +39 02 2699871 Fax: +39 02 26998700
 Manufacturing Plant:

 Via Benessea, 29/B

 17035 Cisano sul Neva (SV)

 Tel.: +39 0182 58641

 Fax: +39 0182 586400



User Manual PMM IMMUNITY SUITE

DATA ACQUISITION PROGRAM FOR RADIATED & CONDUCTED IMMUNITY TESTS

INSTRUMENT SERIAL NUMBER The release number is located on the top title bar of the main window. The version number appears as "Rel. X.XX" (month.year).

Document PMMISEN-21102-2.06 - Copyright © NARDA 2012



NOTE:

® Names and logos are registered trademarks of Narda Safety Test Solutions GmbH and L3 Communications Holdings, Inc. - Trade names are the property of their respective owners.



For safe operation of the instrument, it must be used exactly as described in this manual.

Before operating the instrument in any way, the user must read the manual with care and become fully familiar with all precautions advised.

Proper use and safety can only be assured with thorough knowledge of all information contained herein.



This document may be revised without notice.

SYMBOL USED IN THIS MANUAL

N.	DANGER	The DANGER symbol warns of a risk to human safety. All instructions must be fully understood and followed before proceeding.
M	WARNING	The WARNING symbol alerts the user to a risk of damage to the device or malfunction. All instructions must be fully understood and followed before proceeding.
N	ATTENTION	The ATTENTION symbol highlights actions necessary for the device to work properly.
\sim	NOTE	The NOTE symbol points out information of particular importance.



Contents

	Page
Safety precautions	V
1 Installing the program	Page
1.1 Introduction	1-1
1.2 Hardware requirements	1-1
1.3 Installation.	1.2
1.4 Removal	1-6
2 Program lunch	Page
2.1 User interface	2-2
2.1.1 Litle bar	2-3
2.1.2 Menu	2-4
2.1.2.1 File	2-4
2.1.2.2 ? (Info)	2-4
2.1.3 Selection buttons	2-0
2.1.4 Main window	2-0
3 PMM Immunity Test Radiated	Page
3.1 Introduction to Radiated mode	3-1
3.2 Choosing the compliance standard (Setups)	3-2
3.3 Equipment selection (Components)	3-3
3.4 Diagram window	3-6
	3-7
3.6 Settings management.	3-9
3.7 Setup table	3-10
2.7.1 Automatic table creation	3-10
2.7.2. Monual table greation	3-15
2.7.2 Madifular lable creditori	3-18
3.7.3 Woolinying an existing lable	3-22
A PMM Immunity Test Conducted	Dago
41 Introduction to Conducted mode	raye
4.2 FN 61000-4-3 setups	4-7
4.3 Equipment selection (Components)	4-3
44 Diagram window	4-6
4.5 Settings	4-7
4.6 Settings management	4-9
4.7 System calibration	4-10
4.7.1 Setup table	4-10
4.7.1.1 Automatic table creation	4-11
4.7.1.2 Manual table creation3	4-13
4.7.1.3 Modifying an existing table	4-16
4.8 Immunity test WITH impedance requirements	4-20
4.8.1 Starting the test	4-21
4.9 Immunity test WITHOUT impedance requirements	4-28
4.9.1 Monitoring the current	4-29
4.9.2 Second sweep	4-30
5 PMM Immunity Test Editor	Page
5.1 Introduction to Editor	5-1
5.2 Creating or opening a report	5-2
5.3 Report format	5-3
5.4 Modifying the report	5-4
5.5 Saving the report	5-5
5.6 Printing the report	5-5
5.7 Leaving Editor	5-5

Contents

Ш



Figures

Figure

Page

3-1	Main window - Radiated	3-1
4-1	Main window - Conducted	4-1
5-1	Main window - Editor	5-1

IV



1 – Installing the program

1.1 Introduction	Technological advancements and the increasingly widespread use of electronic equipment for telecommunications, data processing, industrial automation, etc. have led to a growing new field: <i>electromagnetic compatibility (EMC)</i> . Because many devices work in close contact with one another, they can generate electromagnetic interference and may therefore work less effectively. The PMM Immunity Test program will check for this on the basis of your equipment, setup and operating procedures.
1.2 Hardware requirements	 Pentium III processor At least 256 MB RAM At least 50 MB free hard disk space USB or RS232 port (or Bluetooth with optional adaptor) Windows[™] 2000/XP/Vista operating system
<br → NOTE	Updates can be downloaded from <u>www.narda-sts.it</u> or obtained directly from our sales department.



1.3 Installation

The program has to be installed from the CD-ROM to the hard disk before use.

Insert the program CD into the computer's CD-ROM drive. Go to My Computer and double-click the CD-ROM unit where the disc was inserted. To start the installation, double-click the icon **PMM Immunity Suite Setup.**



You can exit the installation by selecting **Cancel.** The following confirmation message will appear:





NOTE

In Windows Vista, most programs are blocked to protect your computer. To start the installation, you may need to allow the program to communicate.

Utiliz	zare il programma esclusivamente se lo si è già utilizzato in precedenza o se ne conosce la enienza.
	Win8630.exe Autore non identificato
+	Annulla La provenienza o lo scopo di questo programma sono sconosciuti.
+	Consenti Il programma è attendibile. La provenienza è nota ed è già stato utilizzato in precedenza.
🔊 D	lettagli

The program will ask you to confirm the installation folder. Choose **Next** to confirm the default directory, or **Change** to select a different folder.

nstallation Folder			
Where would you like PMM	Immunity Suite to be installed?		
The software will be ins either type in a new pat	stalled in the folder listed belo h, or click Change to browse	ow. To select a different locat for an existing folder.	ior
Install PMM Immunity S	uite to:		
C:\Programmi\PMM I	mmunity Suite	C <u>h</u> ange	į.
Space required: 6.29 M Space available on sele	B acted drive: 59.92 GB		
10 h martine	CA Doubly	Next > Cancel	



Installing the program



The software is now ready to be installed. Click $\ensuremath{\textit{Next}}$ to continue the installation.

S PMM Immunity Suite Setup	×
Ready to Install You are now ready to install PMM immunity Suite 1.00	
The installer now has enough information to install PMM Immunity Suite on your computer.	
The following settings will be used:	
Install folder: C:\Programmi\PMM Immunity Suite	
Shortcut folder: PMM Immunity Suite	
Please click Next to proceed with the installation.	2
< <u>B</u> ack <u>N</u> ext > <u>C</u> ancel	

A status window will appear, showing the percentage of files copied into the specified folder.





Once notified that the installation was successful, click **Finish** to complete the process. The folder **PMM Immunity Suite** will be created in your **Programs** folder.



A shortcut will appear on your desktop to allow easy access to the program.





Removal

The recommended procedure for uninstalling the program is as follows: Disconnect the devices attached to the computer. In Windows XP, click

Start (in Windows Vista click the ⁽¹⁾) then All Programs, place the cursor on PMM Immunity Suite, and click Uninstall PMM Immunity Suite.

F	Programmi	•	im PMM Immunity Suite	•	75	PMMImmunitySuite
0	Dati recenti	۲				Uninstall PMM Immunity Suite
D-	Impostazioni	×				
P	Cerca	۲				
0	Guida in linea e supporto tecnico					
0	Esegui					
P	Disconnetti mirko					
0	Chiudi sessione					

The program can also be uninstalled using the Control Panel.

NOTE Use this method if the Uninstall option is not available from Start -> All Programs.

Disconnect the devices attached to the computer. Click **Start**, **Control Panel**, **Programs and Features** (in Windows Vista). Select the program from the application list and click **Remove**.

b PMM Immunity Suite	Dimensioni	<u>3.27MB</u>
Fare clic qui per informazioni sul supporto.	Utilizzato <u>o</u>	<u>ccasionalmente</u>
	Ultimo utilizzo	09/11/2009
Per rimuovere il programma dal computer in uso, scegliere Rimuovi.		Rimuovi

Follow the instructions displayed on the screen.

WARNING When you are prompted to remove shared files, select No. If these files are deleted, other programs that use them may not work properly..

1.4



2 – Run the program



Before running the program, we recommend limiting the number of applications in use.

You can now start the program using the desktop icon.



or, from the Windows XP Start button, selecting All Programs->PMM Immunity Suite->PMM Immunity Suite.



In Windows Vista, click the Windows icon (), then All Programs->PMM Immunity Suite->PMM Immunity Suite.

The title screen appears:



Program lunch



2.1 User interface

The title screen is followed by this interface:



The interface contains:

- 1. Title bar
- 2. Menu
- 3. Selection buttons
- 4. Main window

These are described in greater detail below.



2.1.1 Title bar

From left to right, the title bar presents the icon, the name of the program, and its release. The date and year of the release are shown in parentheses.



The window control buttons (minimize/maximize/close) are also available.



If the main window is minimized, the information will be displayed on the Windows taskbar at the bottom of the screen.



The program can be closed at any time, and the following confirmation message will appear:





or

2.1.2 Menù

The main menu contains these commands:

File ?

- File:

- **? (Info)**:

2.1.2.1 File

The File dropdown menu includes:

Automotive mode.

 PMM Immunity Suite
 Rel.

 File
 ?

 Open
 •

 New Automotive Key Code
 •

 Exit
 •

🏂 PMM Immunity Suite	I. 2.05 (06/11)			
File ?				
Open	Radiated CTRL+R			
New Automotive Key Code	Conducted CTRL+D Automotive CTRL+M			
Exit				

Open: Opens a new work session in Radiated or Conducted

- New Automotive Key Code:

- Exit: Exits the program at any time (subject to confirmation):

2.1.2.2 ? (Info)

The ? dropdown menu includes:



- About: Information on the program creator and customer support.





2.1.3 Selection buttons



A new work session can also be opened using the selection buttons under the main menu. The third button activates the Editor.

- Select **R** to open a new session in Radiated mode.
- Select copen a new session in Conducted mode.
- Select A to open a new session in Automotive mode.
- Select ito open the Editor.

Detailed instructions for the different modes are provided below.

2.1.4 Main window

Radiated mode

The main window displays the active work session or editor session.





Conducted mode



Automotive

PMM Immunity Suite Rel. 2.06 (10/12) - [Automotive]		
RIC A C		- ° ×
	Setup table	Measure
	O Edit table	Make automatic table
PARA	None	
SUITE	Comment	
6530 DUALE 0000+210302 0000+E80306	-	
PhM12020 Fwd Rev	Generator	Start Lai Pause
Anolier		MHz
PMM60000 RF Dir. Couples	-	dBm
E630 DUALE	• Norizo	mA
	Forward	10.0
	Personal Per	dBm
DEVICE NAME	• -	dBm
Setups Components Settings		
0 150 11452 - 4 0 150 11452 - 5		
		Status
BCI Sticker		d (
O B C I + Current Probe		Exit



78 Editor [Linti	tled 1						
	1490	B <i>I</i> <u>U</u> S ≣	@Arial Unicode	MS 🗸 8	 E 	a	
CAPS	NUM	INS				12.14	10/11/2009

See below for further information on these windows



3 – PMM Immunity Test Radiated

3.1 Introduction to Radiated mode

R

Man N	Destabled
New -	Raulateu
Fxit	Conducted

Radiated mode tests your equipment's immunity to the magnetic fields produced by radio transmitters or any other device that emits radiated electromagnetic energy. This kind of radiation may be generated by portable transceivers, base stations, television transmitters, radio transmitters, and other electromagnetic or intermittent sources. To obtain reproducible results, the test should be performed in an anechoic chamber; the standard for equipment, setup and procedure is EN 61000-4-3.





Fig. 3-1 Main window - Radiated

This window contains:

- 1. Menu
- 2. Diagram window
- 3. Function tabs
- 4. Setup table
- 5. Measure

Document PMMISEN-21102-2.06 - © NARDA 2012

Radiated



3.2 Choosing the compliance standard (Setups)

Once Radiated mode is launched, the compliance standard needs to be chosen. The program offers a selection under the **Setups tab**.

- EN 61000-4-3
- 801-3-84
- No Compliant

801-3-84	O No Compliant	
1 point	 9 points - 78% 	
	801-3-84	801-3-84 O No Compliant 1 point Image: State of the sta



3.3 Equipment selection (Components)

After selecting the compliance standard, choose the equipment to be used during calibration or testing.

The program divides equipment by type; for your convenience, drivers from the PMM family can be used.

To enable the desired module, double click the corresponding line (a $\sqrt{}$ will appear next to the instrument selected).

G	Generators		Power Meters				Field Meters			
Selected	Name	Bus type	Bus addr.	Comm. port	Start freq. (MHz)	Stop freq. (MHz)	Min level (dBm)	Max level (dBm)		
	DUMMY GEN	GPIB	X	0	0.01	20000	-100	20		
	PMM 3000	RS232	X	3	0.01	1000	-80	10		
	PMM 3030RS	RS232	X	1	0.009	3000	-107	10		
V	PMM 3030USB	USB	X	×	0.009	3000	-107	10		
	PMM 3010USB	USB	X	X	0.009	1000	-107	10		
	PMM 3010RS	RS232	X	1	0.009	1000	-107	10		

- Generators: Lists the available field generators

- **Power Meter:** Lists the available power meters

G	Generators			ower M	eters	Field Meters			
Selected	Name	Bus type	Bus addr.	Comm. port	Start freq. (MHz)	Stop freq. (MHz)	Min level (dBm)	Max level (dBm)	
	DUMMY PM	USB	0	0	0.01	6000	-40	30	
	PMM 6630	USB	0	0	0.009	3000	-40	30	
V	DUAL 6630	USB	0	0	0.009	3000	-40	30	
	PMM 6600	RS485	1	1	0.01	1000	-40	27	
	DUAL 6600	RS485	1	19 C	0.01	1000	-40	27	

- Field Meters: Lists field probes, optical repeaters and field meters.

Generators			E	PowerN	Aeters	Field Meters				
Selected	Name	Bus type	Bus addr.	Comm. port	Probe name	Start freq. (MHz)	Stop freq. (MHz)	Min level (V/m)	Max level (V/m)	
	DUMMY FM	GPIB	0	0		0.01	10000	0	200	
V	PMM EP601	RS232	0	5	PMM EP601	0.01	9250	0.5	500	
	PMM OR03	RS232	0	5	PMM EP330	0.1	3000	0.3	300	
	PMM 8053	RS232	0	5	PMM EP330	0.1	3000	0.3	300	
	PMM EP600	RS232	0	5	PMM EP600	0.1	9250	0.14	140	

- Others: Lists the amplifier, directional coupler, TEM cell or GTEM antenna.

Generators	
² Directional Coupler orward Coupling 40 teverse Coupling 40	

From this tab, you can set the coupling factors of the directional coupler, the septum distance of the TEM or GTEM (if any), and the name of the amplifier used.



Additional devices can be added to each of these tables by right-clicking and selecting **Add new.**

Generators			Pow	ver Mete	⊮rs ∖	Field Meters				
Selected	Name	Name Bus type	Bus Comm. addr. port		Start freq. (MHz)	Stop freq. (MHz)	Min level (dBm)	Max level (dBm)		
	DUMMY GEN	GPIB	X	0	0.01	20000	-100	20		
	PMM 3000	RS232		Add new		1000	-80	10		
	PMM 3030RS	RS232		Modify		3000	-107	10		
V	PMM 3030USB	USB		in pr		3000	-107	10		
	PMM 3010USB	USB	Remove		B	Remove		1000	-107	10
	PMM 3010RS	RS232	1. 28	Chack D		1000	-107	10		

Immunity Suite - ad	d Generato	r
Instruments name Instr. driver name Instr. brand		
Bus type		Bus Address 0
From	to	MHz
Level limits	to	dBm
-		Save Close

Devices can also be checked, modified or removed by right-clicking from the corresponding line:

G	enerators	1	Pov	ver Mete	ers Ť	SX
Selected	DUMMY GEN DUMMY GEN PMM 3000 PMM 3030RS PMM 3030USB PMM 3010USB PMM 3010RS	Bus type	Bus addr.	Comm, port	Start freq. (MHz)	Stop (M
	DUMMY GEN	GPIB	X	0	0.01	20
	PMM 3000	RS232	X	3	0.01	10
	PMM 3030RS	RS232	X	1	0.009	30
V	PMM 3030USB	* *		3	0.009	30
	PMM 3010USB	Add ne	W	8	0.009	10
	PMM 3010RS	Modify			0.009	10
	(M)	Remov	е			
		Check [Device			

For connecting and setting the COM port of fiber optic equipment, see the user manual supplied with the device.



- Modify: changes the properties of the device.

Immunity Su	iite - add	Generato	or						
Instruments name Instr. driver name		PMM 30	PMM 3030USB						
		PMM30							
Bus type	USB	~	Bus Address 0						
Com Port m	un.	0							
Frequency	range								
From	0.0	09 to	3000 MHz						
Level limits) 								
From	-10	07 to	10 dBm						
			Save Close	ľ					

- Remove: removes the device and its driver from the list.

- **Check Device:** makes sure the driver is working and the device is properly connected. This option is only available for the device selected ($\sqrt{}$).

If the device is connected and the driver has been correctly installed, the following message will appear:

PMM 30	30USB 🛛 🛛
٩	Driver testDriver works correctly Device testDevice OK

This message will appear if the device has not been connected properly to the work setup



If the driver of the device has not been installed properly, the screen will show:



We recommend performing a device check before starting the calibration phase or immunity test. In any case, before calibration or testing, the program runs an automatic check and reports any errors as described above.

Radiated



3.4 Diagram window

The diagram window shows the setup to be followed on the basis of the compliance standard and equipment selected.



The selected devices ($\sqrt{}$) are shown at the bottom of the panel.

In addition to using the **Components** tab, you can move from one type of equipment to another by clicking the label with the device's name **PMM 3030USB** in the diagram window.



3.5 Settings

After performing the setup shown in the diagram window, the calibration and test parameters need to be set using the **Measure** tab:



The **Multiscan** feature allows you to modify measurement parameters within a given frequency range.

Immunity	mmunity Suite - Radiated - MULTISCAN Setup											
Start MHz	Stop MHz	Step %	Dwell ms	Modulation	Depth %	Table Name	Level V/m	C W MHz				
27	500	1	1000	OFF 😼	80	ble_80_90 🖌	10 👿	900				
						ble_80_90 🔽						
						ble_80_90 🗸	~					
						ble_80_90 🗸						
						ble_80_90 🗸	~					
				·		ble_80_90 🔽						
				×		ble_80_90 🗸	V					
						ble_80_90 💟	~					
				CW D	well Time	[sec] 30		Close				



With the **Break points** tab, you can set the frequencies at which measurement will be temporarily suspended to allow a change in setup.

Ň	teasure	Break points	Charts		
	Freq. MHz	Comment			
Stop 1	.22	Cambia Amplificatore			
Stop 2	.32	Cambia Amplificatore			
Stop 3					
Stop 4		-100			
Stop 5		9 71			

Each time the stop frequency is reached, a message will display the scheduled action.

Break point 2 🛛 🔀				
(į)	Cambia Amplificatore			
[ок			

Click **OK** to continue measuring.

The **Charts** tab allows visual modifications to suit your preferences. For each element, click on the color shown, and change it using the Windows color box if desired.

In this tab, you can also move the reference level along the y-axis (+ and - buttons), or change the power level and range (in dBm) and the magnetic field range (in V/m).

Setups		Components	Settings	
Meas	Jre	Break points	Charts	
Graph type Linear Break points	Chait BackColor Grid Color	Reference	Reference\Range dBm Level 0 Range 100 v	
Color Cursor Color	Trace ✓ Generator ✓ Field meter	Forward PM Reverse PM	Reference\RangeV/m level 10 Range 0	



Open setting	Ctrl+O
5ave setting	Ctrl+S
Save setting as	Ctrl+A
Display	
Exit	Ctrl+X

3.6 Settings management For each new session, the default file RadDefault.tst is loaded. To avoid having to re-enter preferred settings, they can be saved in a single .tst file:

> The command File -> Save setting overwrites the file in use. If no file was called up when the program was opened, the default file will be overwritten. The following message will appear:

PMMImn	nunitySuite	0
(į)	The settings file will be changed, are you sure	es.
	Sî No	

Choose YES to overwrite the file in use. Choose NO to cancel the operation and return to the main window.

File -> Save setting as... Enter the file name assigned to the work session and press Save.

Nome file:	Settings_80_90	<u> </u>	Salva
Salva come:	Radiated Immunity Settings Files (*.TST)	<u> </u>	Annulla

The file can be called up at any time with the command File -> Open setting.

Radiated Immu	nity Settings Fi	le Browsing && Openin	g			? 🔀
Cerca in:	🔁 Var		•	+ 🗈 (* 💷 *	
📁 Recent	RadDefault.tst	: 0.TST				
Desktop						
) Documenti						
Risorse del computer						
	Nome file:	ſ			-	Apri
Risorse di rete	Tipo file:	Radiated Immunity Settings	Files (*.T	ST)	*	Annulla
		F Apri in sola lettura				

File -> Display -> Default colors is used to restore the original display.



.....

Pause

Status

Exit

Measure

You can now calculate the levels assigned to the generator in order to 3.7 Setup table have a constant field value within the chosen frequency range.

There are different ways to create the table:

- Automatically (select Make automatic table)

- By adapting the automatically created table to the instrumentation used (select Edit table)

- By completing the entire table manually (select Edit table)

M Immunity Suite - Radiated (IEC 61000-4-3) Setup table 40.00 14.0 O Edit table O Make automatic table 30.00 13.0 20.00 12.0 Comment 10.00 11.0 0.00 10.0 O Const. Field method O Const. Power method dBm 9.0 -10.00 View Data Start Test -20.00 8.0 Generator ----- MHz -30.00 7.0 ----- dBm • -40.00 6.0 Field Meter • ----- V/m -50.00 5.0 -60.00 4:0 80.0 81.0 82.0 83.0 84.0 85.0 86.0 87.0 88.0 89.0 90.0 (2)(1)MHz Setups Components Settings Measure Break points Charts Graph type Chart Reference Reference\Range dBm (4)(3) BackColor Linear 0 Range 100 🗸 Level + Grid Color m Break points

Forward PM

Reverse PM

Reference\Range V/m

10

level

10 💌

Range

3.7.1 Automatic table creation

Radiated

Trace

Generator

Field meter

3-10

Color

Cursor

Color



To create a table automatically:

- Select Make automatic table

O Edit tab	le 🔷 Make automa	atic table
Select	, assign a name to tl	he table and press Save
Nome file:	table_80.90	- Salva
Salva come:	Table Files (*.Fac)	✓ Annulla

If an existing table is selected, the following message will appear:

Save FIL	E TABLE as 🛛 📓	5
⚠	C:\Programm\PMM Immunity Suite\Calibrations\table_80_90.FAC esiste già Sostituirlo?	5
	Si No	

Choose YES to overwrite the table.

Choose NO to cancel the operation and return to the main window.

- A comment can be added, if desired.

Comment		

- Calibration can be performed using the constant field strength method or the constant power method (consult EMC regulations for further details.

O Const. Field method O Const. Power method

- Press **Start test**, then **Abort test** if you wish to terminate the process at any time.

Start Test	د	Abort Test
Start Test	\rightarrow	Abort 1 es

A **Pause** button is also available, and becomes **Continue** to resume the process.

Pause	$\left \right\rangle$	Continue
	98 📥 🗏	Contraction of the second

Once the calibration has begun, a message will appear stating that the limit will be multiplied by 1.8 as required by EMC regulations.

ySuite	X
imit will be multiplied by 1.8 d	luring calibration.
ОК	
	ySuite imit will be multiplied by 1.8 c

Radiated



The **Generator** window shows the level (in dBm) entered by the generator, at a given frequency (in MHz), to generate the chosen magnetic field level.

	OF 770000 MILL-
	85.770820 MHZ
•	-32.4 dBm

The color of the dot corresponds to the color of the line on the graph.

The field level generated inside the cell is displayed in the **Field Meter** window.

Field Meter		Field Meter
•	18.192 V/m	◆ 22.192 V/m

Values outside the selected tolerance will be shown in red; the generator will adjust the level to bring the magnetic field back into range. The color of the dot corresponds to the color of the line on the graph.

During the work session, the frequency range, the generator level, and the magnetic field produced can be viewed graphically View Chart or in table form View Data





Radiated



Because the immunity test is only valid if there is an area within the shielded chamber where field uniformity complies with the standard, the field sensor has to be arranged in different positions. The program keeps track of those positions in the following window:



- A *Green* circle indicates that the calibration has been completed.
- An Orange circle indicates calibration in course.
- A Yellow circle shows where the next calibration will take place.

The Status window shows each operation performed by the program during the calibration phase.

Frequency Sent

Press the **Exit** button to leave **Radiated mode** (the button is deactivated during the calibration phase).

Exit



3.7.1.1 Amplifier saturation test

When constant field calibration is complete, you may choose to run the amplifier saturation test.



Select **YES** to run the saturation test within the frequency range.

Amplifer saturation Test	
Test @ 81.608 MHz	

The test verifies the difference specified in EMC regulations between the power calculated during the calibration phase with the limit 1.8 times that of the test (Pc) and the power to be applied during the testing phase (Pt). If the outcome is positive, the amplifier is not saturated and the system is suitable for the immunity test.

Otherwise, the following message will be displayed:



In both cases, a .txt file is generated at the end of the saturation test; the file is located in the folder **PMM Immunity Test/Temp** and can be viewed from the Editor feature (see the Editor section for further information).

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		۵ 🐇 🗅 🛍	BI	<u>U</u> S 📰	Courier New	🖌 8.5	🖌 🗄 🔚 🖉
Freq. MHzPc $-$ Pt $=$ Dif. 80.00 -31.31 $ -36.41$ $=$ 5.10 80.80 -31.47 $ -36.41$ $=$ 4.94 81.61 -31.31 $ -36.64$ $=$ 5.33 82.42 -31.23 $ -36.48$ $=$ 5.33 83.25 -31.31 $ -36.64$ $=$ 5.33 84.08 -31.14 $ -36.48$ $=$ 5.34 84.92 -31.31 $ -36.42$ $=$ 4.93 85.77 -31.23 $ -36.42$ $=$ 5.19 86.63 -31.39 $ -36.48$ $=$ 5.09 88.37 -31.47 $ -36.49$ $=$ 5.02 89.25 -31.31 $ -36.33$ $=$ 5.02	table_80_90	: Saturation t	est - 1	2/11/2009 -	10.00.35		
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	Freq.MHz	Pc		Pt	5	Dif.	
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	80.00	-31.31	1.5	-36.41	3 c .	5.10	
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	80.80	-31.47	100	-36.41	=	4.94	
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	81.61	-31.31	14	-36.64	14	5.33	
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	82.42	-31.23	100	-36.48	(=)	5.25	
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	83.25	-31.31	100	-36.64	-	5.33	
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	84.08	-31.14	-	-36.48	=	5.34	
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	84.92	-31.31		-36.24		4.93	
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	85.77	-31.23	1	-36.42	(=)	5.19	
87.49 -31.3936.48 = 5.09 88.37 -31.4736.49 = 5.02 89.25 -31.3136.33 = 5.02	86.63	-31.39		-36.33	. .	4.94	
88.37 -31.4736.49 = 5.02 89.25 -31.3136.33 = 5.02	87.49	-31.39		-36.48	=	5.09	
89.25 -31.3136.33 = 5.02	88.37	-31.47	2 - 2	-36.49	. =	5.02	
	89.25	-31.31	100	-36.33	(:=:	5.02	
90.00 -31.2336.33 = 5.10	90.00	-31.23	1.5	-36.33	6 c a s	5.10	



3.7.2 Manual table creation

You may also fill in the entire table manually.

PMM Immu	nity Suite - Radiated	(IEC 61000)-4-3)				
		None		1		Setup table	Measure
		Frequency	Level	1		for the second s	
		80.0000 •	(mar)			 Edit table 	 Make automatic ta
		80.8000 •	10000				
		81,6080 •	(mark)			Modify	
		82.4241 •	10000				
		83.2483 •	(mark)			Hemove	
		84.0808	(1111)			Fill Table	Clear Table
		84.9216	100000 C				
		86.6285	(mm)			Diak	
		87 4948	1			DISK	
		88,3698	(1111)			Loa	d_Browse
		89.2535 •	10000				1
		90.0000 •	(and)			Save	Erase
						Table information	
						Table Name	None
						Ctart	80.0000 MH-
						Start	00.0000 WITZ
						Stop	90.0000 MHz
						Step	1.00 %
						Loval	10.0 V/m
						Level	10.0 V/III
	Setups	Com	oonents	S	ettings		
IV	Measure	Breal	k points	Ϋ́ (Charts		
requency		Level				1	
Start	80.000 MHz	Limit	10 🐱 V/m	Dweiltime	1000 ms		
Stop	90.000 MHz	Tolerance	1.0 V/m	Measures Power/f	ield		
Step	1.0 %	Modulation		⊙ dBm	⊖ V/m	1.1.1	
RFOFF	900.000 MHz	Type Int /	AM 1KHz 🛛 🛛	Multiscan			
Step pe	ercent	Depth	80 %	Enabled	Setup		
And the second s		and the second second	1 00 m 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	and the second second second			

Check the information in Setups, Components and Settings.

Go to Setup table -> Edit table.

Select the desired cell, type in the value, and confirm by pressing ENTER.

Frequency	Level
80.0000	• 2000 N
80.8000	• K
81.6080	
82.4241	
83.2483	
84.0808	
84.9216	
85.7708	
86.6285	
87.4948	
88.3698	
89.2535	
90.0000	• : : : : : : : : : : : : : : : : : : :



The amount entered can be deleted by clicking Remove.

Modify



If several values need to be entered between two end points, use the Fill Table command. The required values are generated by a mathematical formula and marked with a red dot.

Frequency	Level	Frequency	Level
80.0000	-32.1	80.0000	✓ -32.1
80.8000		80.8000	• -32.2
81.6080	•	81.6080	• -32.3
82.4241		82.4241	• -32.4
83.2483	•	83.2483	• -32.4
84.0808	•	84.0808	• -32.5
84.9216	•	84.9216	• -32.6
85,7708		85.7708	• -32.7
86.6285	.	86.6285	• -32.8
87,4948	i	87.4948	• -32.8
88.3698	1	88.3698	• -32.9
89.2535		89.2535	• -33.0
90.0000	🗸 -33.1	90.0000	-33.1

The Clear Table command deletes all of the values entered. The command must be confirmed.

Frequency	Level	
80.0000	-32.1	
80.8000	✓ -32.2	
81.6080	✓ -32.2	
82.4241	-32.3	
83.2483	✓ -32.4	
84.0808	-32.5	TABLE 📐 🔛
84.9216		-16
85.7708		Are You Sure you
86.6285		want to Clear TABLE ?
87.4948	• (aaaa)	
88.3698	•	
89.2535	•	OK Annulla
90.0000		

The Table information pane displays the main measurement settings. Table informatio

Start 80.0000 MH Stop 90.0000 MH
Stop 90.0000 MH
4.00
Step 1.00
Level 10.0 V/r

Radiated



Once all values have been entered, click **Save**, then type in the name of the table and click **Save** again

	Load_Browse	
Sav	e Erase	
ome file:	table_80_90	💌 Salva

If an existing table is selected, a confirmation message will appear to make sure you want to overwrite the file:

Save FI	LE TABLE as 🛛 🔣
⚠	C:\Programmi\PMM Immunity Suite\Calibrations\table_80_90.FAC esiste già. Sostituirlo?

The **Erase** command deletes all data in an existing table. Select the table in the *ERASE FILE TABLE* window and click **Open**, then confirm the command.

ERASE FILE TAB	LE					? 🔀
Cerca in:	Calibrations		•	+ 🗈 💣	•	
D Recent	table_80_90.1	FAC				
Desktop						
) Documenti						
Risorse del computer	-					
S	Nome file:	table_80_90			•	Apri
Risorse di rete	Tipo file:	Table Files (*.Fac)			•	Annulla
		🔲 Apri in sola lettura				





3.7.3 Modifying an existing table

🥙 PMM Immunity Suite - Radiated	(IEC 61000-4-3)			
	Frequency Level 80.0000 -37.3 80.8000 -37.3 81.6080 -37.2 82.4241 -37.2 83.2483 -37.2 84.9216 -37.2 85.7708 -37.2 86.6285 -37.2 87.4948 -37.3 89.2535 -37.2 90.0000 -37.3 89.2535 -37.2 90.0000 -37.2		Setup table	Measure Measure Make automatic table Clear Table Erase table 30 90 80.0000 MHz 90.0000 MHz 1.00 %
I Setups	Components) Settings	Comment	
Measure Frequency Start 80.000 Stop 90.000 Step 1.0 RF OFF 900.000	Break points Level V/m Limit 10 v V/m Tolerance 1.0 V/m Modulation Int AM 1KHz v	Charts Dwelltime 1000 ms Measures Power/field Image: Comparison of the second sec		
Step percent	Depth 80 %	Enabled Setup	E	xit

An existing table can be adapted to the instrumentation used.

Check the information in Setups, Components and Settings.

Go to Setup table -> Edit table.



Call up a previously created table by clicking **Load_Browse**, then selecting the table in the *Table File Browsing & Opening* window and clicking **Open**.

LOAD_DIOM26	
221-122	

Table File Brow	vsing && Open	ing				? 🛛
Cerca in:	Calibrations		•	÷ 🖻 💣	;;;;; ~	
📁 Recent	table_80_90.1	FAC				
Desktop						
) Documenti						
Risorse del computer						
	Nome file:	table_80_90			-	Apri
Risorse di rete	Tipo file:	Table Files (*.Fac)				Annulla
		Apri in sola lettura				

Select the desired cell, click **Remove**, type in the new value, and confirm by pressing ENTER.

Frequency	1	Level		
80.0000	V	-37.3 N		
80,8000	V	-37.3 15		
81.6080	V	-37.2		
82.4241	V	-37.2		
83.2483	V	-37.2		
84.0808	V	-37.2		
84.9216	V	-37.2		
85,7708	V	-37.2	Modify	
86.6285	V	-37.2] [27.2 dBm
87.4948	V	-37.3	Remove	Sr.2 ubm
88.3698	V	-37.3		
89.2535	V	-37.2	Fill Table	Clear Table
90,0000	V	-37.2		20. X



To delete all data, select Clear Table and confirm



If several points need to be entered between two end points, use the **Fill Table** command. The required values are generated by a mathematical formula and marked with a red dot.

Frequency	Level	Frequency	Leve
80.0000	· -37.2	80.0000	-37.2
80.8000	-37.3	80.8000	-37.3
81.6080	· -37.2	81.6080	·37.2
82.4241	• <i></i>	82.4241	• -37.2
83.2483	• <i>9</i> 97	83.2483	• -37.2
84.0808	• 201	84.0808	• -37.2
84.9216	• 200	84.9216	• -37.2
85.7708	• ***	85.7708	• -37.3
86.6285	• (****	86.6285	• -37.3
87.4948	V -37.3	87.4948	Y -37.3
88.3698	- 37.3	88.3698	Y -37.3
89.2535	· -37.2	89.2535	-37.2
90.0000	-37.2	90.0000	-37.2

The Table information pane displays the main measurement settings.

Table Name	table_80_90
Start	80.0000 MHz
Stop	90.0000 MHz
Step	1.00 %
evel	10.0 V/m
omment	

Radiated


When all changes have been made, click **Save**, then type in the name of the table and click **Save** again.

	Load_Browse	
Save	Erase	
ome file:	table_80_90	Salva

If an existing table is selected, a confirmation message will appear to make sure you want to overwrite the file.

Save FI	LE TABLE as	
⚠	C:\Programmi\PMM Immunity Suite\Calibrations\table_80_90.FAC e Sostituirlo?	siste già.
	Sì No	

The **Erase** command deletes all data in an existing table. Select the table in the *ERASE FILE TABLE* window and click **Open**.

ERASE FILE TAE	ILE				? 🔀
Cerca in:	Calibrations		•	- 🗈 💣 📰	,
2	table_80_90.6	FAC			140
Recent					
Desktop					
) Documenti					
Risorse del					
	Nome file:	table_80_90			Apri
Risorse di rete	Tipo file:	Table Files (*.Fac)			Annulla
		🔲 Apri in sola lettura			

Confirm as requested.



Radiated



3.8 Radiated immunity test

Once the setup table is ready, the radiated immunity test can be run. Go to **Measure**.



Click Start Test.

If no setup table has been selected, the following message will appear:



Click OK, then select the table and confirm with Open.

Table File Brow	vsing & Open	ing			? 🔀
Cerca in:	Calibration	\$	💌 O 🕫 I	• 🛄 🤊	
📁 Recent	table_10v.F	rc7 mod.Fct			
Desktop					
) Documenti					
S Bisorse del					
computer	Nome file:	table_10v		× (Apri
	Tipo file:	Table Files (*.Fct)		-	Annulla
Bisorse di rete		Apri in sola lettura			

Radiated



Otherwise the message that appears is as follows:

PMMImmunitySuite	
Selected Calibration Table is "table	_10v", would you like to change it?

Choose **Yes** to view the *Table File Browsing* & *Opening* window and select a different table. Choose **No** to use the file shown and open the following data entry window (the date and time are entered automatically).

Immunit	y Suite - Info 8	: Log	
- Test Rep	oort		
Date	02/12/2009	Time	12.39.18
Title			Company
E.U.T.			S/N
Ambier	nt		
Temp	erature	Humidity	% Atm. pressure mb
Table	table_10v		Operator
Note:			
			Done Abort

Enter the name of the immunity test.

Title	Î		Ì
111100	81	1.1.1.1.1	L

Click and enter the test name, then Save.

Nome file:	Radiated_test_80_90		Salva
Salva come:	Text Files (*.txt)	•	Annulla

If an existing test is selected, a confirmation message will appear.



Fill in the fields Company, E.U.T., S/N, Temperature, Humidity, Atm. Pressure, Operator and Note.



The data entry window is now complete:

nmunit	y Suite - Info & L	.og		
Test Rep	ort			
Date	16/11/2009	Time	14.41.03	
Title R	adiated_test_80_9	90.bt	Company	Narda STS
E.U.T.	Nome del dispositi	ivo sotto test		S/N FR0015A231
Ambier Temp	it erature 22	Humidity	50 % Atm	. pressure 100 mb
Table	table_80_90		Operator	Rossi Mario
Note:				
				<u> </u>

Confirm with Done to start the immunity test.

If an existing test is selected, a confirmation message will appear:



Choose **Yes** to overwrite the data with the test in course. Choose **No** to append the new data.



Radiated



During the test, the **Generator** window shows the level extrapolated from the setup table and used by the generator to obtain a constant magnetic field in the selected frequency range. The color of the dot corresponds to the color of the line on the graph.

Frequen	су
82	2.424080 MHz
Level –	
•	-37.2 dBm

The Measures pane includes:

- Forward: shows the direct power measured by the power sensor.

- **Reverse:** shows the reflected power measured by the power sensor. **Field:** shows the magnetic field generated within the cell. The color of the dot corresponds to the color of the line on the graph.



During the immunity test, the frequency range, generator level and magnetic field will be shown in graph form.



At any time, the test can be terminated by clicking the **Abort Test** button and confirming:



Radiated



The **Pause** button can also be used at any time to stop the test momentarily (the generator is set to RF OFF). In this state, an earlier situation can be recreated or a later one can be simulated; click the RF button (the generator is set to RF ON), adjust the frequency and level, and click **Measure** to display the values.

Freque	ency
8	5.770820 MHz 🕇
Level	
•	-37.2 dBm
	RF
asures	
	4.0 dBm
	-10.4 dBm
	3.439 V/m

Each time the **Pause** button is clicked, the following window will appear:





Pressing **Save** assigns a marker to the current position for future reference. At the end of the test, the saved information can be viewed simply by hovering the cursor over the marker.







The status window shows each operation performed by the software during the test.



The end of the immunity test will be announced with the message:

IEC 61000-4-3	
(i) Test F	inished
ОК]



When the test is over, the graph can be saved in .bmp format by rightclicking anywhere in the graph and selecting **Save bmp**.



In the next window, assign a name to the graph and press Save.

Nome file:	graph_test_80_90	👻 (Salva
Salva come:	bitmap (*.bmp)	✓	Annulla

The saved graph can be inserted into a text file using the Editor feature (see the Editor section for details).

Press the Exit button to leave the immunity test.

1	Exit
з	



4 – PMM Immunity Test Conducted



Fig. 4-1 Main window - Conducted

This window contains:

- 1. Menu
- 2. Diagram window
- 3. Function tabs
- 4. Setup table
- 5. Measure;

Document PMMISEN-21102-2.06 - © NARDA 2012

Conducted



- 4.2 EN 61000-4-6
SetupsOnce Conducted mode is launched, the type of setup needs to be chosen.
The program offers:
 - CDN/Clamp
 - Clamp + Current probe

Setups	Components	Ŷ Settings
⊙ IEC 61000-4-6		
CDN/Clamp		
O Clamp + Current probe		

Conducted



4.3 Equipment selection (Components)

In this phase you will select the equipment to be used during calibration or testing. The program divides equipment by type; for your convenience, drivers from the PMM family can be used. To enable the desired module, double click the corresponding line (a $\sqrt{}$ will appear next to the instrument selected).

Generators		Power Meters		S	Devices		Probes	
Selected	Name	Bus type	Bus addr.	Comm. port	Start freq, (MHz)	Stop freq. (MHz)	Min level (dBm)	Max level (dBm)
	DUMMY GEN	GPIB	X	0	0.01	20000	-100	20
	PMM 3000	RS232	X	3	0.01	1000	-80	10
	PMM 3030RS	RS232	X	1	0.009	3000	-107	10
V	PMM 3030USB	USB	X	X	0.009	3000	-107	10
	PMM 3010USB	USB	X	X	0.009	1000	-107	10
	PMM 3010RS	RS232	X	1	0.009	1000	-107	10

- Generators: Lists the available field generators

- Power Meter: Lists the available power meters

Generators		Powe	Power Meters			evices	Y Probes		
Selected	Name	Bus type	Bus addr.	Comm, port	Start freq. (MHz)	Stop freq. (MHz)	Min level (dBm)	Max level (dBm)	
	DUMMY PM	USB	X	X	0.01	6000	-40	30	
V	PMM 6630	USB	X	X	0.009	3000	-40	30	
	PMM 6600	RS485	1	1	0.01	1000	-40	27	

- Device: Includes all Clamp and CDN models.

Generators		Υ	Power Me	Devices	
Selected	Name	Туре	Min level (dBm)	Max level (dBm)	
	EMCLAMF	Clamp	-100	10	
	M3-25	CDN	-40	10	
V V	EM101	Clamp	-40	10	

- **Current Probes:** Shows current probes with the names of their calibration files.

Generators		Power Meters	Devices)	Probes		
Selected	Name	Cal .File				
V	33_1_411	33_1_411.cpf				

- Others: Shows the amplifier,

Generators	Power Meters	Devices	Probes	Others
Invironment impedanc	e			
150 ohm	○ 50 ohm			
Amplifer	A	Itenuator		
Name PMM 6000	N	c an		



Additional devices can be added to each of these tables by right-clicking and selecting **Add new**.

Gene	erators [Power Meters		Devices		Probes		
Selected	Name	Bus type	Bus addr.	Comm. port	Start freq. (MHz)	Stop freq. (MHz)	Min level (dBm)	Max level (dBm)
	DUMMY GEN	GPIB	7			20000	-100	20
	PMM 3000	RS232	2	Add nei	N	1000	-80	10
	PMM 3030RS	RS232	2	Modify		3000	-107	10
V	PMM 3030USB	USB	X	Remove	4	3000	-107	10
	PMM 3010USB	USB	3-	Security 4	5 () . ()	1000	-107	10
	PMM 3010RS	RS232	2	Check D)evice	1000	-107	10

Immunity Suite - add G	ienerato)r
Instruments name Instr. driver name	[*************************************	
Bus type	~	Bus Address 0
Com Port num. Frequency range	0	
From	to	MHz
Level limits From	to	dBm
	4	Save Close

Devices can also be checked, modified or removed by right-clicking from the corresponding line:

Gene	erators 🛴	Power	Meter	s Ť	Devi	ces
Selected	Name	Bus type	Bus addr.	Comm. port	Start freq. (MHz)	Stop freq. (MHz)
	DUMMY GEN	GPIB	X	0	0.01	20000
	PMM 3000	RS232	X	3	0.01	1000
	PMM 3030RS	RS232	X	1	0.009	3000
V	PMM 3030USB	TICR	×	8	0.009	3000
	PMM 3010USB	Add ne	W	K	0.009	1000
	PMM 3010RS	Modify	Modify		0.009	1000
		Remove	•			
		Check [Device			

NOTE

For connecting and setting the COM port of fiber optic equipment, see the user manual supplied with the device.



- Modify: changes the properties of the device

Immunity Su	ite - add	Generato	or	
Instruments	name	PMM 30	30USB	
Instr. driver i	name	PMM30	30U	
Bus type	USB	~	Bus Address	0
Com Port nu	m.	0		
Frequency r	ange	_n ×		
From	0.00	09 to	3000 MH	z
Level limits	1			
From	-10	7 (0	10 dB	n
			Save Co	ose

- Remove: removes the device and its driver from the list.

- **Check Device:** makes sure the driver is working and the device is properly connected. This option is only available for the device selected ($\sqrt{}$).

If the device is connected and the driver has been correctly installed, the following message will appear:

PMM 30	30USB 🛛 🔀
į)	Driver testDriver works correctly Device testDevice OK

This message will appear if the device has not been connected properly to the work setup



If the driver of the device has not been installed properly, the screen will show:



We recommend performing a device check before starting the calibration phase or immunity test. In any case, before calibration or testing, the program runs an automatic check and reports any errors as described above.

Conducted



4.4 Diagram window

The diagram window shows the setup to be followed on the basis of the equipment selected.



The selected devices ($\sqrt{}$) are shown at the bottom of the pane.

In addition to using the Components tab, you can move from one type of equipment to another by clicking the label with the device's name **PMM 3030USB** in the diagram window



4.5 Settings

After performing the setup shown in the diagram window, the calibration test parameters need to be set using the **Measure** tab:



The **Multiscan** feature allows you to modify measurement parameters within a given frequency range.

PMM	MULTIS	CAN Setu	p				
MultiSca	an Options Stop	Sten	Dwell	Modulation	Depth	Table Name	Level
MHz	MHz	%	mSec	Houndton	%	Tuble Italie	V/m
							1
							-
				-			•
				-			•
				💽		•	•
						· · · ·	
				·		•	•
						-	Exit



With the **Break Points** tab, you can set the frequencies at which measurement will be temporarily suspended to allow a change in setup.

-N	leasure	Break points	Charts	
	Freq. MHz	Comment	È	
Stop 1	.22	Cambia Amplific	atore	
Stop 2	.32	Cambia Amplificatore		
Stop 3				
Stop 4	1. 1.12	12		
Stop 5		9 71		

Each time the stop frequency is reached, a message will display the scheduled action.

Break p	oint 2 🛛 🔀
(į)	Cambia Amplificatore
[ок

The break points are shown as vertical stripes in the graph.

Click **OK** to continue measuring.

The **Charts** tab allows visual modifications to suit your preferences. For each element, click on the color shown, and change it using the Windows color box if desired.

In this tab, you can also move the reference level along the y-axis (+ and - buttons), or change the power level and range (in dBm), the voltage (in V) and the current (in mA).

Mea	sure	Break points	Charts
Graph type Linear Break points	Chart BackColor Color	Reference position	Reference\Range dBm Value 0 dBm Range 100 v dE Reference\Range V
Color Cursor Color	Trace Generator Monitor	Forward PM Reverse PM	Value 10 V Range 10 V Imas Vitange A Value 66.7 mA Range 100mA V



Open setting	Ctrl+0
Save setting	Ctrl+S
Save setting as	Ctrl+A
Display	
Exit	Ctrl+X

4.6 Settings management For each new session, the default file CondDefault.tsc is loaded. To avoid having to re-enter preferred settings, they can be saved in a single .tsc file:

> The command File -> Save setting overwrites the file in use. If no file was called up when the program was opened, the default file will be overwritten: The following message will appear

PMMImn	nunitySuite		
(į)	The settings file will	be changed, are	you sure?
	51	No	

Choose YES to overwrite the file in use. Choose NO to cancel the operation and return to the main window.

File -> Save setting as... Enter the file name assigned to the work session and press Save.

Nome file:	Setting_10v		Salva
Salva come:	Counducted Immunity Settings Files (*.TSC)	<u>-</u>	Annulla

The file can be called up at any time with the command File -> Open setting.

Conducted Imm	unity Settings	File Browsing && Openi	ing				? 🔀
Cerca in:	🔁 Var		~	00	P	 +	
D Recent	CondDefault. Setting_10v.T Setting_150_4	ISC SC 100.TSC					
Desktop							
) Documenti							
I Risorse del		10 					
computer	Nome file:	Setting_10v				~	Apri
	Tipo file:	Conducted Immunity Setting	s Files (*.TSC)		× (Annulla
Bisorse di rete		Apri in sola lettura				- 1 - 5	14

File -> Display -> Default colors is used to restore the original display.

Conducted



4.7 System calibration

You can now calculate the levels assigned to the generator in order to have a constant voltage within the chosen frequency range.



Arrange the setup as shown in the graph:

4.7.1 Setup table

There are different ways to create the table:

- Automatically (select Make automatic table)
- By adapting the automatically created table to the instrumentation used (select **Edit table)**
- By completing the entire table manually (select Edit table)



4.7.1.1 Automatic table creation

To create a table automatically:

- Select Make	automatic table		
O Edit table	O Make automatic table		
- Select	, assign a name to the table and pres	s Save .	
Nome file:	Table_10v	~ [Salva
Salva come:	Table Files (*,Fct)	× (Annulla

If an existing table is selected, the following message will appear:

Save FIL	E TABLE as 🛛 📓
	C:\Programmi\PMM Immunity Suite\Calibrations\table_10v.FCT esiste già. Sostituirlo?
	Si No

Choose **YES** to overwrite the table.

Choose **NO** to cancel the operation and return to the main window.

- A comment can be added, if desired.



- Press Start test, then Abort test if you wish to terminate the process at any time.



A Pause button is also available, and becomes Continue to resume the process.





The **Generator** window shows the level (in dBm) entered by the generator, at a given frequency (in MHz), to generate the voltage required.



The color of the dot corresponds to the color of the line on the graph.

The voltage applied will be shown in the **Power Meter** window.



Values outside the selected tolerance will be shown in red; the generator will adjust the level to bring the voltage back into range. The color of the dot corresponds to the color of the line on the graph.

During the work session, the generator level and voltage within the frequency range selected will be shown as a graph.





(į)	Calibration Finished
Ĩ	ок

The Status window shows each operation performed by the program during the calibration phase.

Frequency Sent

Press the **Exit** button to leave **Conducted mode** (the button is deactivated during the calibration phase).

Exit

Conducted



4.7.1.2 Manual table creation

You may also fill in the entire table manually.

PMM Imunity Suite - Conduct	ed					
	None				Setup table	Measure
	Freq.(MHZ)	Level (dBm)			Garage	
	0.1500 •				 Edit table 	🔘 Make automatic table
	0.1515 •	2000				
	0.1530 •	2000	1		Modify	
	0.1545 •	<u></u>				2.2 dPm
	0.1561 •	<u>38</u> 22			Hemove	2.2 0011
	0.1577 •	2022			Fill Table	Class Table
	0.1592 •	2020			Fill Table	
	0.1608 •		4			
	0.1624 •	2000			Disk	
	0.1641 •	22.55	4		beel	Browne
	0.1657 •	2222	4		2080_	DIOWSC
	0.1674 •	2222	4		Save	Erase
	0.1690		4			
	0.1707	2000	4		Total Contraction	
	0.1724	2000	4		I able information	
	0.1741	2525	-		Table Name	None
	0.1709		4		Tunte nume	
	0.170		-		Start	.1500 MHz
	0.1734	we.	-		Stop	200.0000 MHz
	0.1012	3335	-		C	1.00 %
	0.1030	2000	-		Step	1.00 %
	1 0.10401				Level	10.0 V
Setups	Comp	onents	Υ Υ	Settings		
⊙ IEC 61000-4-6						
O CDN/Clamp						
Olamp + Current probe						
					E	xit

Check the information in Setups, Components and Settings.

Go to Setup table -> Edit table.

Select the desired cell, type in the value, and confirm by pressing ENTER.

Freq.(MHZ)	Level (dBm)
0.1500	•
0.1515	iiiii
0.1530	iiiii
0.1545	iiiii
0.1561	e 1111
0.1577	i 1000
0.1592	iiiii
0.1608	e 1000
0.1624	e 1000
0.1641	iiiii
0.1657	iiiii 👅
0.1674	e 1000
0 1690	1000 C



The amount entered can be deleted by clicking Remove.



If several values need to be entered between two end points, use the **Fill Table** command. The required values are generated by a mathematical formula and marked with a red dot.

Freq.(MHZ)	Level (dBm)	Freq.(MHZ)	Level (dBm)
0.1500 🗸	-10.2	0.1500	-10.2
0.1575 •		0.1575	-10.3
0.1654	() -++++;	0.1654	-10.4
0.1736		0.1736	-10.5
0.1823		0.1823	-10.6
0.1914 •		0.1914	-10.7
0.2010		0.2010	-10.7
0.2111	()	0.2111	-10.8
0.2216	()	0.2216	-10.9
0.2327	() -++++;	0.2327 •	-11.0
0.2443 •		0.2443 •	-11.1
0.2566		0.2566	-11.2
0.2694		0.2694	-11.3
0.2828		0.2828	-11.4
0.2970		0.2970	-11.5
0.3118		0.3118	-11.6
0.3274		0.3274	-11.6
0.3438		0.3438	-11.7
0.3610	()	0.3610	-11.8
0.3790		0.3790	-11.9
0.3980		0.3980	-12.0
0.4000 🗸	-12.1	0.4000 🗸	-12.1

The **Clear Table** command deletes all of the values entered. The command must be confirmed.

Freq.(MHZ)	Level (dBm)		
0.1500	-10.2		
0.1575	-10.2		
0.1654	-10.2		
0.1736	V -10.2		
0.1823	-10.2	TADLE	
0.1914	-10.2	TADLE	
0.2010	-10.2		v
0.2111	V -10.2	Ore Ve	II STIKA VALL
0.2216			to Clear TARIE
0.2327		Want	to clear TADLE
0.2443			
0.2566			Annulla
0.2694	🐞 ista	UK	Annulia
0.2828			

The **Table information** pane displays the main measurement settings:

?

Start .1500 M Stop 200.0000 M	
Stop 200.0000 M	IHz
	IHz
Step 1.00	0 %
Level 10.	0 V

Conducted



Once all values have been entered, click **Save**, then type in the name of the table and click **Save** again.

	Load_Browse		
Sav	e Erase		
ome file:	Table_10v	V	Salva

If an existing table is selected, a confirmation message will appear to make sure you want to overwrite the file.

Save FI	LE TABLE as 🛛 🛛 🕅
⚠	C:\Programmi\PMM Immunity Suite\Calibrations\table_10v.FCT esiste giå. Sostituirlo?
	Si No

The **Erase** command deletes all data in an existing table. Select the table in the *ERASE FILE TABLE* window and click **Open**, then confirm the command.

Cerca in: Calibrations Cerca in: Cerca in: Cerca in: <th>Cerca in: Calibrations Cerca in: Cerca in: <th>Cerca in: Calibrations Cerca in: Cerca in: <th>SE FILE TAE</th><th>BLE</th><th></th><th></th><th></th><th></th><th></th><th>?</th></th></th>	Cerca in: Calibrations Cerca in: Cerca in: Cerca in: Cerca in: <th>Cerca in: Calibrations Cerca in: Cerca in: <th>SE FILE TAE</th><th>BLE</th><th></th><th></th><th></th><th></th><th></th><th>?</th></th>	Cerca in: Calibrations Cerca in: Cerca in: Cerca in: Cerca in: <th>SE FILE TAE</th> <th>BLE</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>?</th>	SE FILE TAE	BLE						?
Recent Image: Sable_10v.FcT Image: Sable_10v.mod.Fct Image: Sable_10v.mod.Fct Desktop Documenti Nome file: table_10v Tipo file: Table Files (".Fct) April April April April	Recent Image: table_10v_mod.Fct Image: table_10v_mod.Fct <t< th=""><th>Recent Image: table_10v_mod.Fct Desktop Image: table_10v_mod.Fct Documenti Image: table_10v_mod.Fct Nome file: table_10v_mod.Fct Tipo file: table_10v_mod.Fct Image: table_10v_mod.Fct Image: table_10v_mod.Fct Desktop Image: table_10v_mod.Fct Image: table_10v_mod.Fct Image</th><th>Cerca in:</th><th>Calibration</th><th>18.</th><th>~</th><th>0 🕫</th><th>Þ</th><th>•</th><th></th></t<>	Recent Image: table_10v_mod.Fct Desktop Image: table_10v_mod.Fct Documenti Image: table_10v_mod.Fct Nome file: table_10v_mod.Fct Tipo file: table_10v_mod.Fct Image: table_10v_mod.Fct Image: table_10v_mod.Fct Desktop Image: table_10v_mod.Fct Image: table_10v_mod.Fct Image	Cerca in:	Calibration	18.	~	0 🕫	Þ	•	
Desktop Desktop Documenti Risorse del computer Nome file: Lable_10v Tipo file: Table Files (".Fot) Apri Apri in sola lettura	Desktop	Image: Desktop Documenti Image: Docum	D Recent	table_10v.1 table_10v_	FCT mod.Fct					
isorse del computer Nome file: table_10v Apri Apri Apri Apri in sola lettura	Nome file: Tipo file: Table files (".Fct) Apri Apri in sola lettura	isorse del computer Sorse di rete Nome file: table_10v V Apri Tipo file: Table Files (*.Fct) Annulla Apri in sola lettura	Desktop							
iisorse del computer Nome file: table_10v	isionse del computer Nome file: table_10v ✓ Apri Tipo file: Table Files (".F.ct) ✓ Annulla OApri in sola lettura	Isorse del computer Vome file: table_10v Apri Tipo file: Table Files (*.Fct) Annulla Apri in sola lettura) ocumenti							
Computer Nome file: table_10v Apri Image: Tipo file: Table Files (*.Fct) Image: April Annul Image: April Image: Tipo file: Table Files (*.Fct) Image: Annul	computer Nome file: table_10v April Tipo file: Table Files (".Fct) Annulla orse di rete Apri in sola lettura	Computer Nome file: table_10v Apri Tipo file: Table Files (*.Fct) Annulla corse di rete Apri in sola lettura	isorse del		1					
Tipo file: Table Files (*.Fct) Annul Apri in sola lettura	Tipo file: Table Files (".Fct) Annulla orse di rete Apri in sola lettura	Tipo file: Table Files (*.Fct) Annulla Apri in sola lettura	computer	Nome file:	table_10v				~	Apri
Apri in sola lettura	orse di rete Apri in sola lettura	orse di rete		Tipo file:	Table Files (*,Fct)				*	Annulla
UISE UITERE		le 10v FCT	orse di rete		🔲 Apri in sola lettura					
ole_10v.FCT			2) A	re You Sure	YOU					
Are You Sure you	2 Are You Sure you	2 Are You Sure you	~	FROM Disk	?					
Are You Sure you want to ERASE IT FROM Disk ?	Are You Sure you want to ERASE IT FROM Disk ?	Are You Sure you want to ERASE IT FROM Disk ?		0.000000000000	0140					
Image: Display state of the	Are You Sure you want to ERASE IT FROM Disk ?	Are You Sure you want to ERASE IT FROM Disk ?			a alla					

Conducted



4.7.1.3 Modifying an existing table

18 PMM Imunity Suite - Conducted				
	table_10v	31	Setup table	Measure
	Freq.(MHZ) Level (dBm)			
	0.1500 🖌 -2.8		Edit table	O Make automatic table
	0.1515 -2.8			
	0.1530 -2.8		Modify	
	0.1545 -2.8		Permoure	11112
	0.1561 -2.8		riemove	
	0.1577 -2.8		Fill Table	Clear Table
	0.1592			
	0.1608 -2.8		Disk	
	0.1024		Letion.	
	0.1657 -2.8		Load	Browse
	0.1674			
	0.1690 -2.8		Save	Erase
	0.1707 🗸 -2.8			
	0.1724 -2.8		Table information	
	0.1741 🖌 -2.8		÷ 11 11	
	0.1759 -2.8		Table Name	table_10v
	0.1776 -2.8		Start	.1500 MHz
	0.1794 -2.8		Stop	200.0000 MHz
	0.1812 -2.8		Char	1.00.10
	0.1030 -2.0		этер	1.00 %
	1 0.10431		Level	10.0 V
Setups	Components	Settings	Table Automatic DEV	/ICE=F-120
Measure	Break points	Charts		
Frequency	Level	-		
Start 0.150 MHz	Limit 10 🔽 V	Dwelltime 100 ms		
Stop 200.000 MHz	Tolerance 2.50 V			
Step 1.000 %	Modulation			
CW 900.000 MHz	Type Int AM 1KHz 😒	Multiscan	L	
Step percent	Depth 80 %	Enabled Setup	E	ixit

An existing table can be adapted to the instrumentation used.

Check the information in Setups, Components and Settings.

Go to Setup table -> Edit table.

Conducted



Call up a previously created table by clicking **Load_Browse**, then selecting the table and clicking **Open**.

Disk					
	Load_B	rowse			
Sav	/e	Erase			
able File Brov	wsing & Oper	ning			?
Cerca in:	🔁 Calibratio	ns	v 0	🕫 🖻 🛄 •	
Recent Desktop	i table_10v	mod.Fct			
Risorse del computer	Nome file:	table_10v			Apri
	Tipo file:	Table Files (*.Fct)			Annulla
Tisorse di rete		🗌 Apri in sola lettura			

Select the desired cell, click **Remove**, type in the new value, and confirm by pressing ENTER.

ole_10v			
Freq.(MHZ)	Level (dBm)		
0.1500	-2.8		
0.1515	-2.8		
0.1530	-2.8		
0.1545	-2.8		
0.1561	-2.8		
0.1577	-2.8		
0.1592	-2.8	Modify	
0.1608	-2.8		10.000
0.1624	-2.8	Remove	-10.2 dBm
0.1641	-2.8		
0.1657	-2.8	Fill Table	Clear Table
0.1674	-2.8		
0.1000	/ 20		



To delete all data, select Clear Table and confirm.

TABLE	×
Are war	You Sure you nt to Clear TABLE ?
ОК	Annulla

If several values need to be entered between two end points, use the **Fill Table** command. The required values are generated by a mathematical formula and marked with a red dot.

Freq.(MHZ)	Level (dBm)	
0.1500 🗸	-10.2	
0.1575 🗸	-10.2	
0.1654 🗸	-10.2	
0.1736 🗸	-10.2	
0.1823 •	1 333 9	
0.1914 •	1 200 2	
0.2010	1 - 201 2	
0.2111	20020	
0.2216 🗸	-11.4	
0.2327 🗸	-11.4	
0.2443 🗸	-11.4	
0.2566 🗸	-11.4	
0.2694 🗸	-11.4	
0.2828 🗸	-11.4	
0.2970 🗸	-11.4	
0.3118 🗸	-11.4	
0.3274 🗸	-12.1	
0.3438 🗸	-12.1	
0.3610 🗸	-12.1	
0.3790 🗸	-12.1	
0.3980 🗸	-12.1	
0.4000 🗸	-12.1	

Freq.(MHZ)	Level (dBm)	
0.1500	-10.2	
0.1575	-10.2	
0.1654	-10.2	
0.1736	-10.2	
0.1823	-10.4	
0.1914	-10.7	
0.2010	-10.9	
0.2111	-11.2	
0.2216	-11.4	
0.2327	-11.4	
0.2443	-11.4	
0.2566	-11.4	
0.2694	-11.4	
0.2828	-11.4	
0.2970	-11.4	
0.3118	-11.4	
0.3274	-12.1	
0.3438	-12.1	
0.3610	-12.1	
0.3790	12.1	
0.3980	-12.1	
0.4000	-12.1	

The **Table information** pane displays the main measurement settings.

Start .1500 M Stop 200.0000 M	
Stop 200.0000 M	.1500 MH
	200.0000 MH
Step 1.00	1.00 %
Level 10.0	10.01

Conducted



Once all values have been entered, click **Save**, then type in the name of the table and click **Save** again.

	Load_Browse		
Sav	e Erase		
ome file:	Table_10v	V	Salva

If an existing table is selected, a confirmation message will appear to make sure you want to overwrite the file.

Save Fil	LE TABLE as 🛛 🛛 🕅
⚠	C:\Programmi\PMM Immunity Suite\Calibrations\table_10v.FCT esiste già. Sostituirlo?
	Si No

The **Erase** command deletes all data in an existing table. Select the table in the *ERASE FILE TABLE* window and click **Open**, then confirm the command.

>	-		*	G 💋	👂 🗄	1-
ecent	table_10v_	FCT mod.Fct				
B esktop						
) cumenti						
p orse del		Letter and			ā	
mputer N	ome file:	table_10v				<u> </u>
See Ti	ipo file:	Table Files (*.Fct)				Y Ar
se di rete		Apri in sola lettura				



4.8 Immunity test WITH Impedance Requirements (Setups)

If an injection clamp is used, the AE configuration must present common-mode impedance (consult EMC regulations for further details).

If the impedance requirements are satisfied, select CDN/Clamp.

18 PMM Imunity Suite - Conducted	1	
PNIM Mickeyarty SUITE Generator PMIM 3030USB Amplifer PMIM 600011	CDN or Clamp Device F-120	EU
Setups	Components	Settings
⊙ IEC 61000-4-6		
CDN/Clamp Clamp + Current probe		
<u></u>		

Conducted



4.8.1 Starting the test Go to **Measure**.

Graph type

Color

Color

Linear

BackColor

Grid Color

Trace Generator

Monitor

8



Click Start Test.

Reference position -

+ -

Forward PM

Reverse PM

If no setup table has been selected, the following message will appear:

Abort Test

Sending Level

Exit

Status

Pause



Charts

Value 0 dBm Range 100 v dB

Value 10 V Range 10 👻 V

Value 66.7 mA Range 100mA 😒

Reference\Range dBm

Reference\Range V

Imax \Range A

Click OK, then select the table and confirm with Open.

able File Brow	vsing & Open	ing				? 🛿
Cerca in:	Calibration	15	~	0 🕫 🛙	• 🛄 ۹	
D Recent	table_10v	rc r mod.Fct				
Desktop						
) Documenti						
Risorse del						
computer	Nome file:	table_10v				Apri
	Tipo file:	Table Files (*.Fct)			~	Annulla
Risorse di rete		🔲 Apri in sola lettura				

Conducted



Otherwise the message that appears is as follows:

PMMImmunitySuite		
Selected Calibration Table is "table	_10v", would you like to	o change it?

Choose **Yes** to view the *Table File Browsing* & *Opening* window and select a different table. Choose **No** to use the file shown and open the following data entry window (the date and time are entered automatically).

Immunit	ty Suite - Info & Lo	9		
- Test Rep	port			ñ
Date	02/12/2009	Time	12.39.18	
Title			Company	
E.U.T.			SN	
Ambie Temp	nt perature H	lumidity 🗌	% Atm. pressure	mb
Table	table_10v		Operator	
Note:				
			Done	Abort

Enter the name of the immunity test.

Title			
Click 🛄 a	nd enter the test name, the	en Save .	
Nome file:	Conducted_test_10v	~	Salva
Salva come:	Text Files (*.txt)	•	Annulla
f an existin Save File Re	g test is selected, a confirmat port as	tion message w	vill appear
C:\F Sos	?rogrammi\PMM Immunity Suite\Reports\Co :ituirlo?	nducted_test_80_90.t	xt esiste già.

SÌ

Fill in the fields Company, E.U.T., S/N, Temperature, Humidity, Atm. Pressure, Operator and Note.

No



The data entry window is now complete:

nmunity Suite - Info & L	og		
Fest Report			
Date 17/11/2009	Time	15.36.29	
Title Conducted_test_10v.b	t	ompany N	arda STS
E.U.T. Nome del dispositiv	/o sotto test	S/N	FR0015A231
Temperature 22	Humidity 50	% Atm. pr	essure 1100 mb
Table table_10v		Operator F	Rossi Mario
Note:			
			()(
			Done Abor

Confirm with **Done** to start the immunity test.

If an existing test is selected, a confirmation message will appear:



Choose **Yes** to overwrite the data with the test in course.





Conducted



During the test, the **Generator** window shows the level extrapolated from the setup table and used by the generator to obtain the required voltage.

The color of the dot corresponds to the color of the line on the graph



During the test, the frequency range and generator level will be shown in graph form.



At any time, the test can be terminated by clicking the **Abort Test** button and confirming:



Conducted



The **Pause** button can also be used at any time to stop the test momentarily (the generator is set to RF OFF).

In this state, an earlier situation can be recreated or a later one can be simulated; click the RF button (the generator is set to RF ON), adjust the frequency and level with the arrows, and click **Measure** to display the voltage.



Each time the Pause button is clicked, the following window will appear:





Pressing **Save** assigns a marker to the current position for future reference. At the end of the test, the saved information can be viewed simply by hovering the cursor over the marker.



The button will now read Continue to resume the test.



The status window shows each operation performed by the software during the test.

Frequency Sent

The end of the immunity test will be announced with the message:

(į)	Test Finished
	ок

Conducted



When the test is over, the graph can be saved in .bmp format by rightclicking anywhere in the graph and selecting **Save bmp**.



In the next window, assign a name to the graph and press Save.

Nome file:	graph_test_80_90	👻 (Salva
Salva come:	bitmap (*.bmp)	~ (Annulla

The saved graph can be inserted into a text file using the Editor feature (see the Editor section for details).

Press the Exit button to leave the immunity test..

	Tradit.	1
	EXIT	



4.9 Immunity test WITHOUT impedance requirements (Setups)

If the impedance requirements cannot be met, the current produced by the induced voltage must be checked using a supplementary probe placed between the injection clamp and the EUT (see EMC regulations for further details). For this configuration, select **Clamp + Current probe.**



This procedure provides only significant differences with respect to the previous test.


4.9.1 Monitoring the current

Go to Measure.



The example below shows the current and the generator level during a test in which the current limit is exceeded and then brought back into range by the software. The correct generator levels will be saved and used during the second sweep.



Conducted



4.9.2 Second Sweep

When the process has finished, you can save the new table calculated during the first sweep. If no name is assigned, the program will use the name of the previous table and add "_ modified" (e.g. tabc_ 10v_modified.fct).

After the file is saved, a prompt will appear to conduct a second sweep with the new table.



The graph below shows the new generator levels applied during the second sweep.



At the end of the test, the table will appear with the new values marked by a red dot.

Ú.1654	Y	-10.2	
0.1736	Y	-10.2	
0.1823		-10.4	
0.1914		-10.7	
0.2010		-10.9	
0.2111		-11.2	
0.9910	1	સંસ્થ	



5 – PMM Immunity Test Automotive

5.1 Introduction to conducted mode

🏕 PMM Immunity Suite R	el. 2.06 (10/12)
File ?	
Open 🕨	Radiated Ctrl+R
New Automotive Key Code	Conducted Ctrl+D
New Hatomotive Key Code	Automotive Ctrl+M
Exit	

The purpose of the test is to check the immunity of equipment, individual devices or systems to disturbances caused by radiofrequency electromagnetic fields to connection cables, power cords, signal lines and ground wires. The standard for equipment, setup and procedure is EN 61000-4-6.





Fig. 5-1 Main window - Automotive

This window contains:

- 1. Menu
- 2. Diagram window
- 3. Function tabs
- 4. Setup table
- 5. Measure;

Document PMMISEN-21102-2.06 - © NARDA 2012

Automotive



5.1.1 Automotive option activation

The Automotive section of the Software suite is an optional feature.

To enable the Automotive test, use the Automotive Key Code tool in the program.

7-NOTE

For further information on software installation refer to the "Installing the program" chapter.

75 p	MM Immunity Suite Re	l. 2.06
File	?	
0	pen 🕨	
N	ew Automotive Key Code	1999
E	xit	

Click on "File"	and choose "I	New Automotive	Key code"	for running the
Set code utility,	so getting the f	following window:		

PMM Immunity Suite							
Instruments name	РММ3030						
Bus type RS232 🗸	Comm Port n° 1						
Key code 0123456789012345678901234567890123456789							
(Try <u>C</u> lose						

Select the proper instrument model, the bus type and eventually the port for communicating with it, and simply copy the 40 Digit Serial Code in the Key Code text box, then select Window and select the **Try** button.

This message appears when the Key code is not valid.



Or it is not the right code for your instrument:





It will be shown the following progress bar indicating the module is being loaded.



This means also the Key Code has been successfully stored.

Then the module is ready to be used.

To use the Automotive tool, the registered PMM signal generator must be correctly connected to the PC running the software and switched on.

If the generator is unconnected or switched off the following message appears:

PMM Immunity Suite	\mathbf{X}
PMM Generator not found.	Connect and switch on PMM Generator and retry.
	ОК

5.2 EN 61000-4-6 Setups

⁻NOTE

Once Automotive mode is run, the type of setup needs to be chosen. The program offers:

- ISO 11452-4 with BCI and, in case, Current Probe

- ISO 11452-5 with Stripline

Setups	Components	Settings
⊙ ISO 11452 - 4	O ISO 11452 - 5	
B C I B C I + Current Probe	Stripline	



5.3 Equipment selection (Components)

In this phase you will select the equipment to be used during calibration or testing. The program divides equipment by type; for your convenience, drivers from the PMM family can be used. To enable the desired module, double click the corresponding line (a $\sqrt{}$ will appear next to the instrument selected).

- Generators: Example list of the available field generators

	Generators		Power Meters		Field Meters		Devices		Current Probes		Others		
Γ	Selected		Name		S/N	Bus type	Bus addr.	Comm. port	Start fr (MH	req. z)	Stop freq. (MHz)	Min lev (dBm)	el Maxlevel (dBm)
	V	GENER/	ATORE 3030	00	10WE70204	RS232	X	1	0.00	19	3000	-107	10
		(STUB30	30	9	STUB3030	USB	Х	X	0.00	19	3000	-107	10
Г		PMM 30	00	F	PMM 3000	RS232	X	2	0.01	1	3000	-80	10
		PMM 30	10	F	PMM 3010	USB	X	X	0.00	19	1000	-107	10

- Power Meter: Lists the available power meters

Generators Power Meters		ers Fie	Field Meters		Devices		Current Probes		Others		
	Selected	Name Position		S/N	Bus type	Bus addr.	Comm. port	Start freq. (MHz)	Stop freq. (MHz)	Min level (dBm)	Max level (dBm)
		3×PMM6630	Monitor Forward Reverse	000WX10317 000WX10302 000WE80306	USB	×	×	0.009	3000	-40	30
l	V	2× PMM6630	Forward Reverse	000WX10302 000WE80306	USB	×	×	0.009	3000	-40	30
		DUAL 6600	Forward Beverse	PRIMARY SECONDARY	RS485	0	3	0.01	1000	-40	27

- Device: Includes all BCI models.

[G	enerators	Power Meters			Field	d Meters	Devices
	Selected	Name	S/N	Туре	Min level (dBm)	Max level (dBm)		
	V	DEVICE NAME	Device S/N	B.C.I.	-30	0		

- **Current Probes:** Shows current probes with the names of their calibration files.

Generators		Power Meters	Devices	Probes
Selected	Name	Cal .File		
V	33_1_411	33_1_411.cpf		

- Others: Shows the amplifier,

Generators Y Power Me	iters Devices	Probes	Others
Environment impedance ③ 150 ohm 〇 50 ohm			
Amplifer Name PMM 6000N	Attenuator 6 dB		

Automotive



Additional devices can be added to each of these tables by right-clicking and selecting **Add new.**

Gene	Generators		Power Meters		Devi	ces	Probes		
Selected	Name	Bus type	Bus addr.	Comm. port	Start freq. (MHz)	Stop freq. (MHz)	Min level (dBm)	Max level (dBm)	
	DUMMY GEN	GPIB	7			20000	-100	20	
	PMM 3000	RS232	2	Add new		1000	-80	10	
	PMM 3030RS	RS232	Modity			3000	-107	10	
V	PMM 3030USB	USB.	Demove			3000	-107	10	
	PMM 3010USB	USB.	3-	STREET		1000	-107	10	
	PMM 3010RS	RS232	> Check		evice	1000	-107	10	

Immunity Suite - add	d Generator
Instruments name	
Instr. driver name	PMM3000
Bus type RS232 🗸	Bus Addrs 0 Comm Port nº 1
S/N	
Frequency range	
From 0.0	.01 to 3000 MHz
Level limits	
From -8	80 to 10 dBm
	Save Close

Devices can also be checked, modified or removed by right-clicking from the corresponding line:

Selected	Name	Bus type	Bus addr.	Comm. port	Start freq. (MHz)	Stop freq (MHz)	
	DUMMY GEN	GPIB	X	0	0.01	20000	
	PMM 3000	RS232	X	3	0.01	1000	
	PMM 3030RS	RS232	X	1	0.009	3000	
V	PMM 3030USB	THER	×	8	0.009	3000	
	PMM 3010USB	Add ne	W	K	0.009	1000	
	PMM 3010RS	Modify			0.009	1000	
		Remove					
		Check [Device				



For connecting and setting the COM port of fiber optic equipment, see the user manual supplied with the device.



- Modify: changes the properties of the device

Instruments	name	PMM 3	PMM 3030USB							
Instr. driver i	name	PMM3030U								
Bus type	USB	~	Bus Address							
Com Port nu	m.	0								
Frequency r	ange									
From	0.0	09 to	3000 MHz							
Level limits										
From	-10	07 to	10 dBm							

It is possible to modify any of the parameters but the name.

- Remove: removes the device and its driver from the list.

- **Check Device:** makes sure the driver is working and the device is properly connected. This option is only available for the device selected ($\sqrt{}$).

If the device is connected and the driver has been correctly installed, the following message will appear:

PMM 30	30USB 🛛 🔀
į)	Driver testDriver works correctly Device testDevice OK

This message will appear if the device has not been connected properly to the work setup



If the driver of the device has not been installed properly, the screen will show:



We recommend performing a device check before starting the calibration phase or immunity test. In any case, before calibration or testing, the program runs an automatic check and reports any errors as described above.

Automotive



5.4 Diagram window

The diagram window shows the setup to be followed on the basis of the equipment selected.

78 PMM Immunity Suite Rel. 2.0	6 (10/12) - [Auto	motive]								
75 File View										_ 8 ×
R C A										
									Setup table	Measure
									Generator	
PMM									Frequency	
IMMUHITY									80.0	00
SUITE									clevel	
									LOVOI	
	2X PMM6630									
	WX10302 000WE8	0306								
Generator									RF	MOD
GENERATORE 3030	Fwd Rev									
Amplifar									Measures	
Amplifer	-40 dB -40 dB								Monitor	
PMM6000	RF Dir. Coupler									
		_				_			Forward	
									• -	-
AE			BCL				EUT		Reverse	
			Device							-
		lo m								
		DEV	ILE N	AME					Measu	re
					~					
Setups	Co	mponen	its		Į	Set	tings		Stort Toot	Bauaa
Generators Power Meters	Field Meters	8	Devic	es	Currer	nt Probes	Ot	hers	Start Test	Fause
Colosted Name	CAL	Pushing	Bus	Comm.	Start freq.	Stop freq.	Min level	Max leve		
Ndile	37N	Dus (ype	addr.	port	(MHz)	(MHz)	(dBm)	(dBm)		
V [GENERATURE 3030	J 000WE70204	HS232 LISB	×	X	0.009	3000	-107	10	Chalue	
PMM 3000	PMM 3000	RS232	X	2	0.01	3000	-80	10	Statu	IS
PMM 3010	PMM 3010	USB	Х	Х	0.009	1000	·107	10	Jun	
									Exi	1
								<u>·</u>		·)

The selected devices ($\sqrt{}$) are shown at the bottom of the pane.

In addition to using the Components tab, you can move from one type of equipment to another by clicking the label with the device's name **PMM 3030USB** in the diagram window



5.5 Settings

After performing the setup shown in the diagram window, the calibration test parameters need to be set using the **Measure** tab:

Setups		Components	Settings				
Measure	Ì	Break points	Charts				
Frequency Start Stop0 Step	0.090 MHz 00.000 MHz 1.000 MHz	Limit name Default Power limit Factor 4 × ✓ Peak conservation	Modulation Type Int AM 1KHz Depth 80				
Step percent		Multiscan Setup	Dwell Time 1000 ms				

In the limit box there is also the choice for the **Peak conservation**. This is useful to satisfy those regulations requiring that under the condition of amplitude modulated signals the peak level must be the same of the unmodulated ones used for system calibration. It works both for AM and Pulse modulations.

All the modulation types, most common in the standards, are available depending on the model of the generator in use.

The **Multiscan** feature allows you to modify measurement parameters within a given frequency range.

PMM	MULTIS	CAN Setu	ģ.				
MultiSca	in Options	·			(
Start	Stop	Step	Dwell	Modulation	Depth	Table Name	Level
MHz	MHz	~	mSec	(*		V/m
				Off 👻	0	I	-
				·		· · · ·	· ·
				-			-
							•
				-			-
							•
				-			-
							•
							Exit



With the **Break Points** tab, you can set the frequencies at which measurement will be temporarily suspended to allow a change in setup.

Measure		Break points	Charts			
	Freq. MHz	Comment				
Stop 1	.22	Cambia Amplificat	ore			
Stop 2	.32	Cambia Amplificatore				
Stop 3						
Stop 4	322	12				
Stop 5	346	0 11				

Each time the stop frequency is reached, a message will display the scheduled action.



The break points are shown as vertical stripes in the graph.

Click **OK** to continue measuring.

The **Charts** tab allows visual modifications to suit your preferences. For each element, click on the color shown, and change it using the Windows color box if desired.

In this tab, you can also move the reference level along the y-axis (+ and - buttons), or change the power level and range (in dBm), the voltage (in V) and the current (in mA).





Open setting	Ctrl+O
Save setting	Ctrl+S
Save setting as	Ctrl+A
Display	
Exit	Ctrl+X

5.6 Settings management For each new session, the default file CondDefault.tsc is loaded. To avoid having to re-enter preferred settings, they can be saved in a single .tsc file:

> The command File -> Save setting overwrites the file in use. If no file was called up when the program was opened, the default file will be overwritten: The following message will appear



Choose YES to overwrite the file in use. Choose NO to cancel the operation and return to the main window.

File -> Save setting as... Enter the file name assigned to the work session and press Save.

Nome file:	Settings-Automotive	Salva
Salva come:	Automotive Settings Files (*.tsa)	Annulla

The file can be called up at any time with the command File -> Open setting.

Automotive Immunity Settings File Browsing && Opening									
Cerca in:	🚞 Var		*	G	ø	ø	•		
Documenti recenti	AutoDefault.TS	A							
Desktop									
Documenti									
Bisorse del									
computer	Nome file:	Automotive.tsa					*		Apri
	Tipo file:	Automotive Settings Files (*.ts	:a)				*	A	nnulla
Bisorse di rete		🔲 Apri in sola lettura							.::

File -> Display -> Default colors is used to restore the original display.



5.7 System calibration

You can now calculate the levels assigned to the generator in order to have a constant voltage within the chosen frequency range.

38 PMM Immunity Suite Rel. 2.06 (10/12) - [Automotive]		
75 File View		_ 7 ×
	Setup table	Measure
Philip SUTTE SUTTE Generator	Edit table tab_Default Table Automatic DEVICE Generator Generator Forward Forward Reverse Generate Generat	Make automatic table The matrix of the matrix of table The matrix of the matrix of table The matrix of table
Setups Components Settings		
ISO 11452 - 4 ISO 11452 - 5 B C I B C I + Current Probe	51	atus Exit

Arrange the setup as shown in the graph:

5.7.1 Setup table

There are different ways to create the table:

- Automatically (select Make automatic table)
- By adapting the automatically created table to the instrumentation used (select **Edit table)**
- By completing the entire table manually (select Edit table)



5.7.1.1 Automatic table creation

To create a table automatically:

- Select Make a	utomatic table		
O Edit table	O Make automatic table		
- Select , a	ssign a name to the table and press s	Save.	
Nome file:	tab_Default.A4T	× (Salva
Salva come:	Automotive BCI Table Files (*.A4T)	✓	Annulla
If an existing tab	ble is selected, the following message	will appea	ar:
Automotive im	munity settings rile browsing at 5	aving	
C:\Pro Sostiti	ogrammi\PMM Immunity Suite\Var\Automotive. uirlo?	tsa esiste gi,	à.

Choose NO to cancel the operation and return to the main window.

- A comment can be added, if desired.



Sì

- Press **Start test**, then **Abort test** if you wish to terminate the process at any time.

No



A **Pause button is also available,** and becomes **Continue** to resume the process.

543X)	
Pause	
	- 12



Choose **YES** to overwrite the table.



The **Generator** window shows the level (in dBm) entered by the generator, at a given frequency (in MHz), to generate the voltage required.



The color of the dot corresponds to the color of the line on the graph.

The voltage applied will be shown in the **Power Meter** window.



Values outside the selected tolerance will be shown in red; the generator will adjust the level to bring the voltage back into range. The color of the dot corresponds to the color of the line on the graph.

During the work session, the generator level and voltage within the frequency range selected will be shown as a graph.







The Status window shows each operation performed by the program during the calibration phase.

Frequency Sent

Press the **Exit** button to leave **Conducted mode** (the button is deactivated during the calibration phase).

Exit



5.7.1.2 Manual table creation

You may also fill in the entire table manually.



Check the information in Setups, Components and Settings.

Go to Setup table -> Edit table.

Select the desired cell, type in the value, and confirm by pressing ENTER.

Freq.(MHZ)	Level (dBm)
0.1500 •	
0.1515 •	\$2102
0.1530	\$2102
0.1545 •	1002
0.1561 •	1003
0.1577 •	1003
0.1592 •	11133
0.1608 •	11133
0.1624 •	1000
0.1641 •	1000
0.1657 •	11133
0.1674 •	\$1133
0 1690	2222

Automotive



The amount entered can be deleted by clicking **Remove**.

Remove	-10.2 dBm
Fill Table	Clear Table

If several values need to be entered between two end points, use the **Fill Table** command. The required values are generated by a mathematical formula and marked with a red dot.



The **Clear Table** command deletes all of the values entered. The command must be confirmed.

Freq.(MHZ)	Level (dBm)	
0.1500	-10.2	
0.1575	-10.2	
0.1654	-10.2	
0.1736	-10.2	
0.1823	-10.2	TABLE .
0.1914	-10.2	
0.2010	-10.2	-13
0.2111	-10.2	Are You Sure you
0.2216		wash to Clear TAPLE 2
0.2327		
0.2443	. ::::::	
0.2566		
0.2694		
0.2828	. 3200	





Automotive



Once all values have been entered, click **Save**, then type in the name of the table and click **Save** again.

Load_E	Browse
Save	Erase

Nome file:	Calibration-table.A4T	Salva
Salva come:	Table Files (*.A4t)	Annulla

If an existing table is selected, a confirmation message will appear to make sure you want to overwrite the file.

Save FIL	E Table as 🛛 🛛 🕅
1	C:\Programmi\PMM Immunity Suite\Calibrations\Calibration-table.A4T esiste già. Sostituirlo?
	Sì No

The **Erase** command deletes all data in an existing table. Select the table in the *ERASE FILE TABLE* window and click **Open**, then confirm the command.

RASE FILE TA	BLE				?
Cerca in:	Calibrations		🔽 🗯 🔊	⊷ 🕾	
Documenti recenti	Calibration. A	4T able.A4T			
Desktop					
Documenti					
Risorse del					
computer	Nome file:	Calibration-table.A4T		<u> </u>	Apri
(Tipo file:	Table Files (*.A4t)			Annulla
Risorse di rete		Apri in sola lettura			





5.7.1.3 Modifying an existing table

🎏 PMM Immunity Suite Rel. 2.06 ((10/12) - [Automotive]			
🏂 File View				_ 8 ×
R C A				
	Calibration-table]	Setup table	Measure
	Freq.(MHZ) Level (dBm) 0.090 2.8		 Edit table 	O Make automatic table
	0.091 V -2.8 0.092 V -2.8		Modify	
	0.094 -2.8		Remove	
	0.095 V -2.8 0.096 V -2.8		Fill Table	Clear Table
	0.096 V -2.8		Disk	
	0.099 -2.8		Load	Browse
	0.100 -2.8		Save	Erase
	0.102 -2.8		Table information	
	0.104 -2.8		Table Name	Calibration-tab
	0.107 2.8		Start	0.090 MHz
	0.100 -2.8		Stop	400.000 MHz
	0.110 -2.8		Step	1.00 %
	0.112 2.8		Level	10.0 V
	j u.⊓3j v -2.8 ⊡		Device	
Setups	Components	Settings	Table Automatic DEV	/ICE=F-120
Measure	Break points	Charts		
Frequency	Limit name			
Start 0.090 MHz	Default	Dwell Time 1000 ms		
Stop 400.000 MHz	Power limit Factor 4 ×			
Step 1.00 %	Modulation			
	Type Int AM 1KHz 🗸	Multiscan	E	:хіт
Step percent	Depth 80 %	Enabled Setup		

An existing table can be adapted to the instrumentation used.

Check the information in Setups, Components and Settings.

Go to Setup table -> Edit table.



Call up a previously created table by clicking **Load_Browse**, then selecting the table and clicking **Open**.

	Load_Bro	owse			
Sav	′e	Erase			
able File Brov	wsing & Openi	ng			?
Cerca in:	Calibrations	\$	🖌 🖸	• 🖽 对	
Documenti recenti Desktop Documenti					
Risorse del	Nome file:	Calibration-table.A4T		v	Apri
computer	Nome nie.				

Select the desired cell, click **Remove**, type in the new value, and confirm by pressing ENTER.

NG_TOY			
Freq.(MHZ)	Level (dBm)		
0.1500	✓ -2.8		
0.1515	✓ -2.8		
0.1530	✓ -2.8		
0.1545	✓ -2.8		
0.1561	✓ -2.8		
0.1577	✓ -2.8		
0.1592	✓ -2.8	Modify	
0.1608	✓ -2.8	Constant and the second second	10.000
0.1624	-2.8	Remove	-10,2 aBM
0.1641	-2.8		5 C
0.1657	✓ -2.8	Fill Table	Clear Table
0.1674	✓ -2.8	A	
0.1000	20		



To delete all data, select **Clear Table** and confirm.

TABLE	×
2	Are You Sure you want to Clear TABLE ?
ОК	Annulla

If several values need to be entered between two end points, use the **Fill Table** command. The required values are generated by a mathematical formula and marked with a red dot.

ble_150_400			table_150_400		
Freq.(MHZ)	Level (dBm)	*	Freq.(MHZ)	Level (dBm)	
0.1500	-10.2		0.1500 🗸	-10.2	
0.1575	-10.2		0.1575 🗸	-10.2	
0.1654	-10.2		0.1654 🗸	-10.2	
0.1736	-10.2		0.1736 🗸	-10.2	
0.1823	• · · · · ·		0.1823 •	-10.4	
0.1914			0.1914 •	-10.7	
0.2010			0.2010 •	-10.9	
0.2111			0.2111 •	-11.2	
0.2216	-11.4		0.2216 🗸	-11.4	
0.2327	-11.4		0.2327 🗸	-11.4	
0.2443	🖌 -11.4		0.2443 🗸	-11.4	
0.2566	🖌 -11.4		0.2566 🗸	-11.4	
0.2694	-11.4		0.2694 🗸	-11.4	
0.2828	🖌 -11.4		0.2828 🗸	-11.4	
0.2970	-11.4		0.2970 🗸	-11.4	
0.3118	🖌 -11.4		0.3118 🗸	-11.4	
0.3274	🖌 -12.1		0.3274 🗸	-12.1	
0.3438	-12.1		0.3438 🗸	-12.1	
0.3610	-12.1		0.3610 🗸	-12.1	
0.3790	🖌 -12.1		0.3790 🗸	-12.1	
0.3980	-12.1		0.3980 🗸	-12.1	
0.4000	.12.1	-	0.4000 🗸	-12.1	-



Start .1500 M Stop 200.0000 M	
Stop 200.0000 M	MHz
NAME OF TAXABLE PARTY O	MHz
Step 1.0	0 %
Level 10.	0.1/



Once all values have been entered, click Save, then type in the name of the table and click **Save** again.

D	isk,				
		Load_Browse			
	Save		Erase		
Nor	ne file:	Calibration-tab	le.A4T	*	Salva
Sak	va come:	Table Files (*.,	44t)	*	Annulla

If an existing table is selected, a confirmation message will appear to make sure you want to overwrite the file.

Save Fl	LE Table as 🛛 🕅
⚠	C:\Programmi\PMM Immunity Suite\Calibrations\Calibration-table.A4T esiste già. Sostituirlo?
	Sì No

The Erase command deletes all data in an existing table. Select the table in the ERASE FILE TABLE window and click Open, then confirm the command.

ERASE FILE TAE	BLE				? 🔀
Cerca in:	Calibrations		💌 G 🦻 🛙	• 📰 •	
Documenti recenti	Calibration.A41	le.A4T			
Desktop					
Documenti					
Risorse del computer	Nome file:	Calibration-table.A4T		-	Apri
Since director	Tipo file:	Table Files (*.A4t) Apri in sola lettura		•	Annulla
nisuise di fete					



N



5.8 Immunity test WITH Impedance Requirements (Setups)

F

If a bulk current injector is used, the AE configuration must present common-mode impedance (consult EMC regulations for further details).

If the impedance requirements are satisfied, select BCI.

PMM IMMUNITY SUTTE Generator GENERATORE 3030 Amplifer PMM6000H]	6 dB BCI Device DEVICE NAME	EUT	
Setups	Comp	onents	Settings	
 ISO 11452 - 4 B C I B C I + Current Probe 	• ISO 11452 - 5			



5.8.1 Starting the test

Go to Measure.



Click Start Test.

If no setup table has been selected, the following message will appear:



Click OK, then select the table and confirm with **Open.**

Table File Brow	vsing & Opening	<u>.</u>				? 🔀
Cerca in:	Calibrations		~	G 💋	بي 🥙	
Documenti recenti	Calibration.A41	le.A4T				
Desktop						
Documenti						
Computer	Nome file:	Calibration.A4T			*	Apri
Sisorse di rete	Tipo file:	Table Files (*.A4t)			~	Annulla





Otherwise the message that appears is as follows:

PMMImmunitySuite	<
Selected Calibration Table is "Calibration-table", would you like to change it	?
Sì No	

Choose **Yes** to view the *Table File Browsing* & *Opening* window and select a different table. Choose **No** to use the file shown and open the following data entry window (the date and time are entered automatically).

Immunit	y Suite - Info &	Log	
Test Rep	ort		
Date	02/12/2009	Time	12.39.18
Title			Company
E.U.T.			S/N
Ambier	it		
Temp	erature	Humidity	% Atm. pressure mb
Table	table_10v		Operator
Note:			
			Done Abort

Enter the name of the immunity test.

Iva come: Text Files (*.	tst)		- Ann
an existing test is sel			
ave File Report as			
	mmunity Suite'P	ducted test 8	n an hyt exist

Fill in the fields Company, E.U.T., S/N, Temperature, Humidity, Atm. Pressure, Operator and Note.



The data entry window is now complete:

nmunity	y Suite - Info & I	Log		
Test Repo	ort			
Date	17/11/2009	Time	15.36.2	9
Title Co	onducted_test_10v.	bat 🔜 🛄	Company	V Narda STS
E.U.T.	lome del disposit	tivo sotto test		S/N FR0015A231
Temp	table 10v	Humidity e	0 % Atr	n. pressure 1100 mb
Note:	(able_10V		operate	RUSSIMANU
Note.				
				Done Abo

Confirm with **Done** to start the immunity test. If an existing test is selected, a confirmation message will appear:



Choose Yes to overwrite the data with the test in course.



Choose No to append the new data.



During the test, the **Generator** window shows the level extrapolated from the setup table and used by the generator to obtain the required voltage.

The color of the dot corresponds to the color of the line on the graph



During the test, the frequency range and generator level will be shown in graph form.



At any time, the test can be terminated by clicking the **Abort Test** button and confirming:





The **Pause** button can also be used at any time to stop the test momentarily (the generator is set to RF OFF).

In this state, an earlier situation can be recreated or a later one can be simulated; click the RF button (the generator is set to RF ON), adjust the frequency and level with the arrows, and click **Measure** to display the voltage.

Frequen	cy
	.8306 MHz
Level	
•	-2.8 dBm
	RF
asures	
Moniter -	4.26 mV
Monitor -	4.26 mV
Moniter -	4.26 mV
Moniter - Forward Reverse	4.26 mV
Monitor -	4.26 mV
Moniter - Forward Reverse	4.26 mV

Each time the **Pause** button is clicked, the following window will appear:





Pressing **Save** assigns a marker to the current position for future reference. At the end of the test, the saved information can be viewed simply by hovering the cursor over the marker.



The button will now read **Continue** to resume the test.



The status window shows each operation performed by the software during the test.

Frequency Sent

The end of the immunity test will be announced with the message:



Automotive



When the test is over, the graph can be saved in .bmp format by rightclicking anywhere in the graph and selecting **Save bmp**.



In the next window, assign a name to the graph and press Save.

Nome file:	graph_test_80_90	~ (Salva
Salva come:	bitmap (*.bmp)	▼	Annulla

The saved graph can be inserted into a text file using the Editor feature (see the Editor section for details).

Press the Exit button to leave the immunity test..

Exit	J
------	---



5.9 Immunity test WITHOUT impedance requirements (Setups)

If the impedance requirements cannot be met, the current produced by the induced voltage must be checked using a supplementary probe placed between the Bulk Current Injector and the EUT (see EMC regulations for further details).

For this configuration, select **BCI + Current probe.**



This procedure provides only significant differences with respect to the previous test.



5.9.1 Monitoring the current

Go to Measure.



The example below shows the current and the generator level during a test in which the current limit is exceeded and then brought back into range by the software. The correct generator levels will be saved and used during the second sweep.





5.9.2 Second Sweep

When the process has finished, you can save the new table calculated during the first sweep. If no name is assigned, the program will use the name of the previous table and add "_ modified" (e.g. tabc_ 10v_modified.fct).

After the file is saved, a prompt will appear to conduct a second sweep with the new table.







At the end of the test, the table will appear with the new values marked by a red dot.

0.1654	Y	-10.2	
0.1736	Y	-10.2	
0.1823		-10.4	
0.1914		-10.7	
0.2010		-10.9	
0.2111		-11.2	
0.9010	1	ર લેવ ંગ	



This page has been intentionally left blank



6 – PMM Immunity Test Editor

6.1 Introduction to Editor This section explains how to view and correctly interpret the data acquired by the immunity tests.

Start Editor by clicking the button

File F Search							
F (1) 3							
18 Land Untitle	ed]						
1= BAI1	4 m n 1	BIU	Arial Unicode	MS 🔻 8	🔻 🗄 📲	<u>a</u>	
		Ľ					
						11 I.	
CAPS N	IUM	INS				11.43	17/11/2009
							111

Fig. 6-1 Main window – Editor

This window contains:

- 1. Menu
- 2. Command bar
- 3. Main window

Editor



6.2 Creating or opening a report

=ile	Edit	Search
Λ	lew	Ctrl+N
SC.	Inen	Chil+O
ile	Edit	Search
N	ew	Ctrl+N
0	pen	Ctrl+O
S	5V6	CERLS

To create a new report, select **File** -> **New**

To open an existing report, select **File -> Open** or use the *button* on the command bar.

In the window, select the file in the Reports folder and click Open.



The file will appear in the main window.

🏂 Editor [C:	ProgrammiV	MM Immunity SuiteV	Reports\Radiated_test_8	0_90.txt]		
	ጎ ፈ 🗅 🛙	в <i>I</i> ⊻ s :	Courier New	8.5 💌 📃 📳	a	
EN 61000-04-	-03 -	- PMM Inmmuni	ty Suite			~
Date: 16/11/ Time: 15.55.	/2009 59					
Company name						
E.U.T. name:	Nome del d:	ispositivo sotto t	est			
E.U.T. S/N:	FR0015A231	55 6 00,800,800,800,800,800,800,800,800,800,				
Operator: Ro	ossi Mario					
Test equipme	ent:					
Gener	ator:	Narda-STS	PMM 3030USB			
Power	Meter:	Narda-STS	DUAL 6630			
Field	Meter:	Narda-STS	PMM EP601			
Ambient data	a l					
Tenpe	rature: 22					
Humic	lity: 50%					
Atm.	pressure: 10	Omb				
Note:						
Test setting	15:					
Start	Frequency:	80 MHz				
Stop	Frequency: 9	90 MHz				
Step	Frequency: J	L 4				
Modul	ation type:	Int AM 1KHz				
Modul	ation depth:	: 80 %				
Limit	: 10V/m					
Tolle	rance: lV/m					
Dwell	. time: 1 s					
Calib	ration Table	e name: table_80_9	2			
Frank Law n	1 - Times 11	F F6 47 - Riensed				
Event log n	i - lime: 13	5.55.47 - Miapsed	cime: 00:00:49			
Gener	ator Level:	-37.2 dBm				~
	(march	-			from	Lug un incon
LAPS	NUM	INS			12.34	18/11/2009

Editor


6.3 Report format

Below is an example of the report generated at the end of the immunity test:



The format is highly user-friendly and clearly presents all of the information gathered during the test. The information in bracket 1 concerns the equipment under test, the instrumentation used and the ambient data. The rest includes all events that interrupted the test; they are listed in chronological order along with the data acquired at the time of the interruption.

Editor

6-3



6.4 Modifying the report

The report can be adapted to your needs through a series of commands:

ic Sear	cn	
Undo	Ctrl+Z	
Cut	Ctrl+X	
Paste	Ctrl+P	
Сору	Ctrl+C	
Clear	Ctrl+D	
Select A		S & B

The **Edit** menu allows you to **Copy**, **Cut**, **Paste**, and **Clear** text. The entire text can be selected with the **Select All** command. In case of error, the **Undo** feature will reverse unwanted modifications.

- To add images:

Click the **icon** on the command bar to insert .bmp images into the report.

lpri					?
Cerca in:	C Reports		•	🗢 🗈 💣 💷 •	
📁 Recent	Grafico_tes	st_80_90]			
Desktop					
Descurrenti					
Risorse del computer					
	Nome file:	Grafico_test_80_90		<u> </u>	Apri
Risorse di rete	Tipo file:	bitmap (*.bmp)			Annulla
		🦳 Apri in sola lettura			

Select the file and press Open.

-- To change text and color formatting.

Select the part to be modified (by holding down the left mouse button) or the entire report (**Edit ->Select All**, then change the appearance of the text using the buttons and dropdown menus on the command bar:

B I	U	8	28	@Arial Unicode MS	-	8	-	12
-----	---	---	----	-------------------	---	---	---	----

Editor



6.5 Saving the report





C NOTA

To save the report, click:

- Save: to overwrite the document in use, or.
- Save As : to save in one of three formats:
- Calibration log Files (*.WHL)
- Text files (*.txt)
- Rich Text Files (*.rtf)

All files saved in .txt can be viewed by other applications. In Word or Excel, search for the report using the Open file command with File type: All files (*.*). Select the report from your folders and click Open.

6.6 Printing the report

File	Edit	Search
P	rint	Ctrl+T
F	vit	Chil+O
E)		1.1.2.1 .1.1 .1.1

6.7 Leaving Editor



厦

Print the report by clicking **File -> Print** or the button on the command bar

Close the file with **File -> Exit** or the **Heat** button on the command bar.



This page has been intentionally left blank



7 Comulate michigates 7 Comulae peopled

Sales & Support: Via Leonardo da Vinci, 21/23 20090 Segrate (MI) - ITALY Tel.: +39 02 2699871 Jnico Fax: +39 02 26998700

 Manufacturing Plant:

 3
 Via Benessea, 29/B

 17035 Cisano sul Neva (SV)

 Tel.: +39 0182 58641

 Fax: +39 0182 586400



Caro cliente

grazie per aver acquistato un prodotto NARDA! Sei in possesso di uno strumento che per molti anni ti garantirà un'alta qualità di servizio. NARDA riconosce l'importanza del Cliente come ragione di esistenza; ciascun commento e suggerimento, sottoposto all'attenzione della nostra organizzazione, è tenuto in grande considerazione. La nostra qualità è alla ricerca del miglioramento continuo. Se uno dei Suoi strumenti NARDA necessita di riparazione o calibrazione, può aiutarci a servirla più efficacemente compilando questa scheda e accludendola all'apparecchio.

Tuttavia, anche questo prodotto diventerà obsoleto. In questo caso, ti ricordiamo che lo smaltimento dell'apparecchiatura deve essere fatto in conformità con i regolamenti locali. Questo prodotto è conforme alle direttive WEEE dell'Unione Europea (2002/96/EC) ed appartiene alla categoria 9 (strumenti di controllo). Lo smaltimento, in un ambiente adeguato, può avvenire anche attraverso la restituzione del prodotto alla NARDA senza sostenere alcuna spesa. Può ottenere ulteriori informazioni contattando i venditori NARDA o visitando il nostro sito Web www.narda-sts.it.

Dear Customer

thank you for purchasing a NARDA product! You now own a high-quality instrument that will give you many years of reliable service. NARDA recognizes the importance of the Customer as reason of existence; in this view, any comment and suggestion you would like to submit to the attention of our service organization is kept in great consideration. Moreover, we are continuously improving our quality, but we know this is a never ending process. We would be glad if our present efforts are pleasing you. Should one of your pieces of NARDA equipment need servicing you can help us serve you more effectively filling out this card and enclosing it with the product.

Nevertheless, even this product will eventually become obsolete. When that time comes, please remember that electronic equipment must be disposed of in accordance with local regulations. This product conforms to the WEEE Directive of the European Union

(2002/96/EC) and belongs to Category 9 (Monitoring and Control Instruments). You can return the instrument to us free of charge for proper environment friendly disposal. You can obtain further information from your local NARDA Sales Partner or by visiting our website at www.narda-sts.it.

■ <u>Servizio richiesto</u> :						
□ Solo taratura □ Calibration only	□ Riparazione □ Repair	□ Riparazione & ⁻ □ Repair & Calib	Taratura pration	□ Taratura S □ Certified C	IT □ Calibration □] Altro:] Other:
Ditta: Company:						
Indirizzo: Address:						
Persona da contattar Technical contact pers	e: :on:		Telefono: Phone n.			
Modello: Equipment model:			Numero di se Serial n.	erie:		
Accessori ritornat	i con l'apparecchia ed with unit:	tura: □ Nessuno □ None	□ Cavo(i) □ Cable(s)	□ Cavo di a □ Power ca	limentazione Ible	Altro: Other:
☑ <u>Sintomi o problem</u>	ni osservati: 🗹 Obs	erved symptoms / pro	blems:			
Ø Guasto: □ Fisso Ø Failure: □ Contir	ות Intermit uous □ Intermit	tente Sensibile a tent Sensitive to:	: □ Freddo □ Cold	□ Caldo □ Heat	□ Vibrazioni □ Vibration	□ Altro □ Other
Descrizione del guas Failure symptoms/spec	to/condizioni di fun cial control settings c	zionamento: lescription:				
,		1				
Se l'unità è parte di u If unit is part of system	n sistema descrive	rne la configurazion prconnected equipmer	e: ht and system s	set up:		

Suggerimenti / Commenti / Note: Suggestions / Comments / Note: