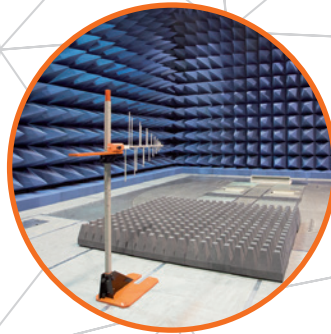


FLEXIBLE EMC

Test & Measurement Solutions

PRODUCT
OVERVIEW





Company overview

Since 2008, Microwave Vision Group has combined the technological expertise, product portfolios and infrastructures of four industry leaders: SATIMO, ORBIT/FR, AEMI and Rainford EMC Systems who have joined forces to provide a wide variety of products and solutions for Antenna Measurements and Electro-Magnetic Compatibility (EMC) Testing.

For EMC Solutions we design, manufacture, supply and install shielded enclosures, anechoic chambers, shielded doors, absorbers and more. Through our partnership with Amplifier Research (AR), we can provide exceptional turnkey solutions for the most demanding EMC requirements.

With revenue of Euros 60 million (2015) and 19 years continual growth, MVG is now present in 10 countries with 23 sites. Our 350 employees worldwide are driving Microwave Vision Group's technical success through continual innovation.

OUR EMC TESTING SOLUTIONS

Our solutions support the Aerospace & Defense, Telecommunications, commercial electronics and Automotive industries, as well as Universities and Institutional Research. Whether testing for emissions, immunity, compliance or pre-compliance, MVG's portfolio of EMC Testing products, in particular, help you to optimize your testing processes. MVG brings together technical excellence and first class R&D to deliver innovative EMC Testing products for both the European and worldwide markets.

OUR RF RESEARCH & DEVELOPMENT







Our 55 R&D engineers work tirelessly to develop our superior range of EMC Testing products with the impressive 9.3% of revenue which we plough back into product research and development.

Many private companies and public offices choose our EMC testing products to ensure that their tests are compliant to the latest industry standards. Testament to the high quality of our EMC products is that Dyson Ltd, as well as other industry leaders, have chosen MVG's EMC Test chambers to help them deliver efficient, on-site, EMC testing to fully compliant levels.

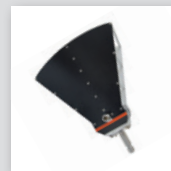
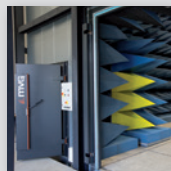
“ We design, manufacture, supply and install rooms and chambers for EMC, RF, Microwave and Antenna testing.

Quick Guide of MVG's EMC Test Chamber Solutions



Product Name	EMC MC Mini Compact Chamber	EMC-3C Pre-Compliance Compact Chamber	EMC-3m Fully Compliant Chamber	EMC-5m Test Range Chamber	EMC-10m Anechoic Chamber	MIL-STD Chamber
Dimensions (shield)	6 m x 3 m x 2.4 m	7 m x 3 m x 3 m	8.9 m x 5.6 m x 5.8 m	11.5 m x 7.5 m x 5.8 m	21 m x 12 m x 8.5 m	Dimensions may vary. E.g: a test bench up to Aircraft
RF Frequency Capability	26 MHz – 40 GHz	30 MHz - 40 GHz Radiated Immunity: 30 MHz - 18 GHz Shielded door 30 MHz - 18 GHz 1m QZ	30 MHz - 40 GHz Radiated Immunity: 30 MHz - 18 GHz Shielded door 2m QZ	30 MHz - 40 GHz Radiated Immunity: 30 MHz - 18 GHz Shielded door 3m QZ	30 MHz - 40 GHz Radiated Immunity: 30 MHz - 18 GHz Shielded door 3m > QZ	10 KHz - 40 GHz
Applicable Industry Standards	Pre Compliant: • ANSI C63.4 • FCC Parts 15 & 18 • EN 50147-2 • EN50011/CISPR 11 • EN550016/CISPR 16 • EN550022/CISPR 22 • VCCI V-3/2004.04 • 2004/104/EC-SAE J551 /CISPR25	Pre compliant: • CISPR-16 Compliant: • EN61000.4.3	Compliant: • ANSI C63.4 • MIL STD 461F • CISPR 16-1-4 • EN61000.4.3	Compliant: • ANSI C63.4 • MIL STD 461F • CISPR 16-1-4 • EN61000.4.3	Compliant; • ANSI C63.4 • MIL STD 461F • CISPR 16-1-4 • EN61000.4.3	• MIL STD 461 • RTCA DO 160
Materials	SmartShield shielding with HyPyr-Loss™ Ferrite and Hybrid absorbers for 26 MHz - 40 GHz	SmartShield shielding with HyPyr-Loss™ Ferrite and Hybrid absorbers for 26 MHz - 40 GHz	SmartShield shielding with HyPyr-Loss™ Ferrite and Hybrid absorbers for 26 MHz - 40 GHz	SmartShield shielding with HyPyr-Loss™ Ferrite and Hybrid absorbers for 26 MHz - 40 GHz	SmartShield shielding with HyPyr-Loss™ Ferrite and Hybrid absorbers for 26 MHz - 40 GHz	SmartShield shielding with HyPyr-Loss™ Ferrite and Hybrid Lining available
Datasheet						

Complimentary EMC Products to our Anechoic Test Chamber Solutions



Product Name	Mode Stir/ Reverberation Chamber	RF Shielded Rooms	SmartShield Door Systems	Hyperloss RF Absorbers NEW	EMC Antennas NEW
Application	Often used for very high field strength immunity testing applications. Typically 7000V/m or more may be generated with such designs	<ul style="list-style-type: none"> • EMC Testing (conducted emissions, conducted immunity) • Shielded control and amplifier rooms • RF development testing • Electromagnetic pulse protection • Electromagnetically secure environments • Medical (audiology, EEG, etc) 	A very efficient RF shielded door system to complement any RF shielded room environment including TEMPEST & EMPP designs	Both Broadband antenna & Hybrid EMC applications available. The ULTRA is a new Polypropylene material only available from MVG	EMI Testing for commercial, automotive, and mil/aero applications
RF Frequency Capability	80 MHz - 40 GHz	10 KHz - 100 GHz plus	10 KHz - 100 GHz plus	10 KHz - 100 GHz plus	30 MHz to 18 GHz
Applicable Industry Standards	MIL-STD 461 RTCA/DO 160	<ul style="list-style-type: none"> • IEEE-Std-299 • IEC/EN 50147-1 March 1996 	<ul style="list-style-type: none"> • IEEE-Std-299 • IEC/EN 50147-1 March 1996 	<ul style="list-style-type: none"> • ANSI 63.4 • CISPR 11, 12, 13, 16-1-4, 16-1-6, 25, 32 • EN 61000-6-3, EN 61000-6-4 • FCC Part 15, 18, 25, 90 • IEC 60601-1-2 • MIL-STD 461 • RTCA/DO 160 	<ul style="list-style-type: none"> • ANSI 63.4 • CISPR 11, 12, 13, 16-1-4, 16-1-6, 25, 32 • EN 61000-6-3, EN 61000-6-4 • FCC Part 15, 18, 25, 90 • IEC 60601-1-2 • MIL-STD 461 • RTCA/DO 160
Benefits	Modular or welded construction screened rooms with stirrer paddles, automated servo motors and test software	<ul style="list-style-type: none"> • Flexible modular panel or welded room designs with doors, filters and all RF penetrations • All accessories to ensure RF shielding specifications are achieved. 	<ul style="list-style-type: none"> • Doors with manual, semi-auto and fully-auto functions. Large range of dimensions available • High level of RF shielding compatible with our screened room performance 	<ul style="list-style-type: none"> • Wide range of RF polyurethane & Polypropylene pyramidal absorbers • Ferrite tile materials where required 	<ul style="list-style-type: none"> • Stiff/robust & lightweight mechanical design • Reduced higher order modes • Smooth AF • High reliability N coaxial connector
Datasheet					



Today's industry is highly competitive. The secrecy in their knowledge and developments has been a crucial element in Dyson's success to date. But how do they achieve this? Fabio Scalon, Principal Engineer at Dyson Ltd says: ... "our tests are all completed in house in our SAC which helps us to maintain confidentiality and keep product developments on-site rather than shipping to outside test facilities. This also gives us the capability to test to the standards specified by the industry, namely CISPR, IEC and FCC."



The existing chamber was evaluated by MVG and upgraded to refit new "Hyperloss" hybrid absorber matched to the existing ferrite tiles. Fabio explains, "With changes in the complexity of our products, we now have a need to also test for Electro Magnetic Fields (EMF) up to 2.7 GHz. The upgraded chamber will allow us to do this, therefore expanding both the capability and the performance of the chamber."

EMC FAQs

Why do you need to use a professional EMC test laboratory environment?

To ensure accuracy of answers and to meet compliance regulations, such as the Euro Norms series of European regulations for compliance of products.



Allegro MicroSystems are an industry leader in the world of integrated circuit (IC) design. Their design and testing center in Manchester, New Hampshire, USA invests in testing to ensure that their developments deliver exactly what their customers need. However, this was becoming increasingly challenging using off-site services.



In 2014, Richard Garvey, Director of Systems Engineering, decided it was time to review their testing processes. They chose a SmartShield Anechoic chamber from MVG which measured 3.5 m, by 6 m, by 3 m tall. The chamber has the capability to measure EMC from 30 MHz to 1 GHz in accordance with CISPR-25 EMC standard , which met Allegro's current testing needs.



THE BENEFITS

The benefits of having an on-site test facility at Dyson are:

- The capability to test to full compliance on-site.
- It maintains confidentiality during development.
- With prototype testing we can test, check, modify and re-test within minutes.
- Quick validation as we can check and verify compliance when needed.
- Time saving, as we have no delays from using an outside test centre.
- Cost saving, as our test chamber runs 8 hours per day, imagine the costs for outsourcing.

Are the regulations a legal requirement?

Yes and non-compliance of these regulations could result in heavy fines and prevention of product launch to market, or even worse, forced retraction from the market.

Are the European regulations used in other global regions?

Yes, the European regulations are often adopted or duplicated by local standards in many countries outside of mainland Europe.



THE BENEFITS

The benefits of having an on-site test facility at Allegro MicroSystems are:

- The capability to test to pre-compliance on-site in accordance with current EMC standards for our product scope.
- Maintaining confidentiality during the development process.
- During development we can more easily test, check, adapt and re-test.
- We have 100% control of the testing environment.
- Quick validation as we can check and verify compliance when needed.
- Reduced time, resources and costs from using an outside test centre.

THE EMC TEAM



John Noonan

EMC Managing Director

After achieving a B.Sc. Hons (Civil) from University of Warwick in 1983, John went on to achieve the MICE professional qualification. John's career started on a great foundation in the Civil & Structural Engineer sectors, including Government and Military facilities, Nuclear Power & Reprocessing and Structural Steelwork Fabrication before joining us in 1996. Today, as Managing Director of Rainford EMC Systems (a division of MVG), John oversees the development and delivery of a wide variety of EMC projects.



Bill McFadden

EMC Operations Director

Bill originally joined Rainford EMC Systems in 1991 and during the subsequent years has gained extensive experience and knowledge in all disciplines of the company and the Shielded Anechoic Chamber industry. A mechanical engineer who enjoys getting involved at all levels in his role as Operations Director for Rainford EMC Systems, Bill is currently responsible for the manufacturing, Design, Project Management and site install divisions, with a healthy overlap to Technical Sales support.



John White

EMC Sales Director

John has been working in the area of EMC for nearly 30 years and is responsible for the Global EMC sales organisation at MVG. He is a mechanical engineer who is specialized in the anechoic chamber market and is extremely well known in the industry. Combining product knowledge with expert sales and marketing knowledge ensures that what we deliver is one step ahead of the competition. John has particular expertise with international sales and ensures competent partners are selected and supported to grow the EMC business stream of MVG.



Donnie J. Gray

EMC Director Business Development & Technical Sales

After graduating with a B.S. in Mathematics and Economics, Donnie went on to achieve a MSEE from the University of Colorado. Now, as Director of Business Development and Technical Sales at MVG, Donnie's wealth of experience from his 25 years in the industry includes satellite communications, antennas, and electro-magnetic projects both for military and commercial applications helps us to deliver innovative solutions to meet the market needs. As a member of AMTA, IEEE and IEEE EMC, Donnie has contributed towards many industry papers on the topics of antenna measurements, EMC testing, and RF absorber applications.



Mathieu Mercier

EMC Managing Director - Asia Office

After receiving his MSc Science in Electronics and Microwave, Mathieu's career started with Ericsson and continued in antenna measurement systems until he joined MVG in 2003. Now, Mathieu is Technical Director of AMS and MD of EMC for the Asia Pacific region.



Paul Duxbury

EMC Sales Manager - Europe

In 1995, Paul gained his BEng(Hons) in Electrical and Electronic Engineering. He got his grounding in EMC test and measurement while at BSI Testing and then IFR (formally Marconi Instruments). He then worked on electromagnetic simulation for EMC and antenna applications, with a particular emphasis on EMC modelling. With his over 20 years of experience in EMC and antenna measurements and simulation, Paul joined MVG in 2012. He is a member of the IET and IEEE.

OUR PARTNERS



// MVG & AR:

Together we are **one** powerful EMC Solution!

MVG and AR, the RF/Microwave instrumentation powerhouse, have formed a partnership to provide turnkey EMC solutions all over the world.

AR brings its 45 years experience and extensive line of products to join MVG installation expertise and diverse product range to deliver quality, high performance turnkey products for EMC and other markets.

OUR SALES REPS

Our Sales Reps around the world can guide you and give you the necessary support from purchase, through design, delivery and installation. We assure local and speed attention in project follow through. This includes customer support and maintenance once the system is in place.

Where are our Sales Reps?

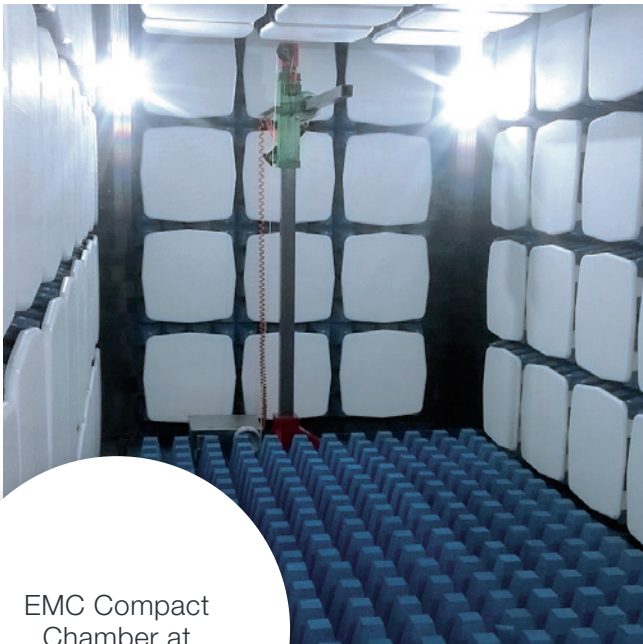
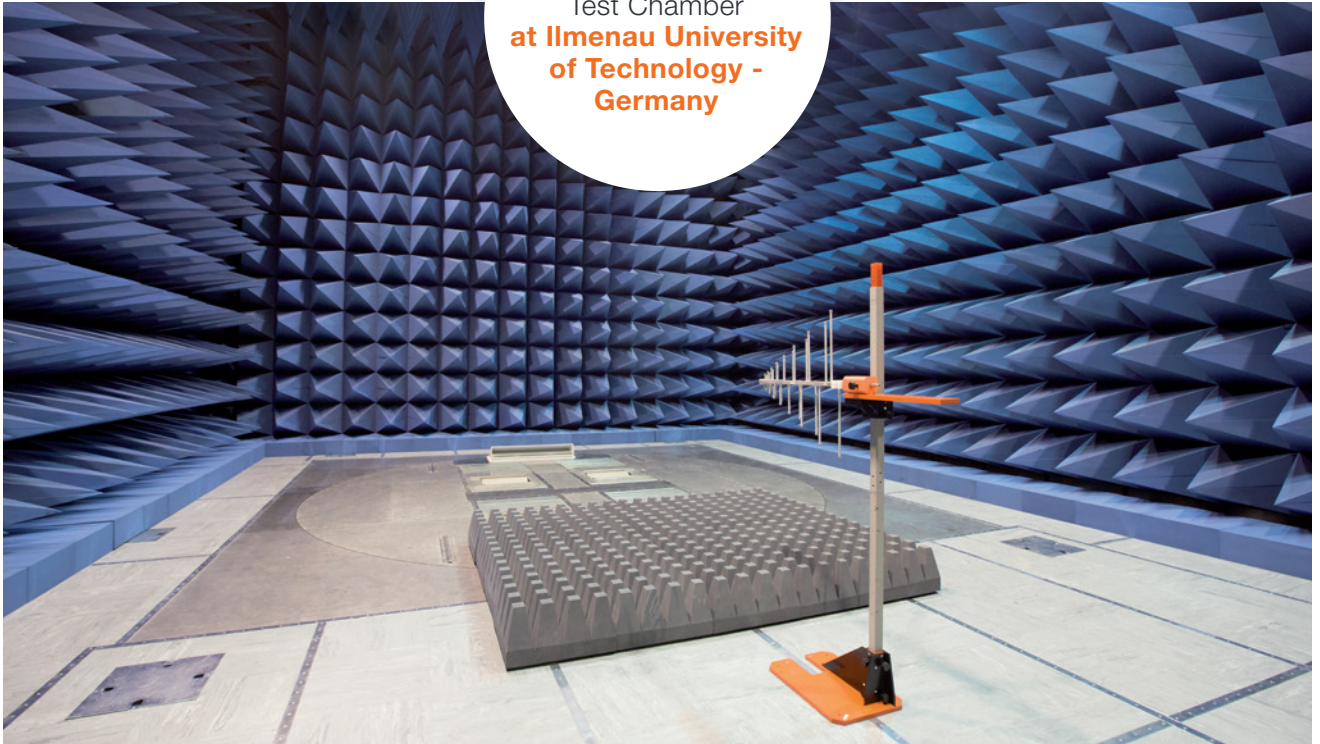
Asia, Europe, North America, Oceania, South America



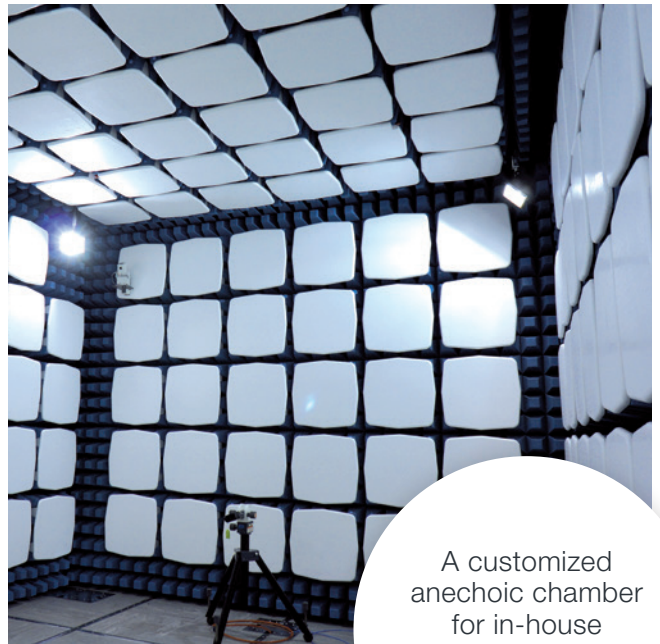
Find the full list of Sales Reps at: <http://www.mvg-world.com/sales-reps/emc>

RECENT CLIENT WINS

Combined AMS & EMC
Test Chamber
at **Ilmenau University
of Technology -
Germany**



EMC Compact
Chamber at
Sonos - USA



A customized
anechoic chamber
for in-house
testing at
Huf North America

About Microwave Vision Group (MVG)

Since its creation in 1986, The Microwave Vision Group (MVG) has developed a unique expertise in the visualization of electromagnetic waves. These waves are at the heart of our daily lives: Smartphones, computers, tablets, cars, trains, planes - all these devices and vehicles would not work without them. Year after year, the Group develops and markets systems that allow for the visualization of these waves, while evaluating the characteristics of antennas, and helping speed up the development of products using microwave frequencies.

The Group's mission is to extend this unique technology to all sectors where it will bring strong added value. Since 2012, MVG is structured around 3 departments: AMS (Antenna Measurement Systems), EMC (Electro-Magnetic Compatibility) and, EIC (Environmental & Industrial Control).

MVG is present in 10 countries and generates 90% of sales from exports. The Group has over 350 employees and a loyal customer base of international companies.

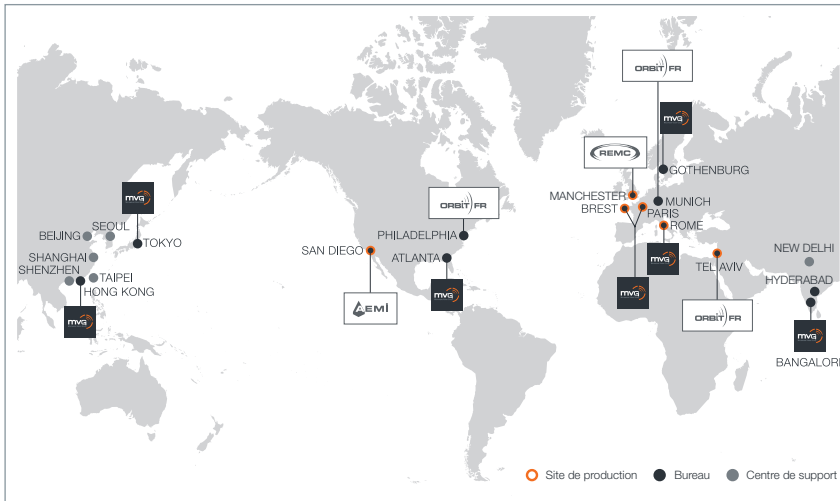
Worldwide Local Project Management and Support

The EMC Testing products are designed and produced by MVG's dedicated center based in Haydock UK and San Diego, USA. The local team is supported by a network of regional offices in North America, Asia and Europe. This local presence enables responsiveness and high quality customer support.

Rainford EMC Systems, an affiliate of MVG, is ISO 9001:2008 certified and ISO 14001:2004 certified.



AEMI is ISO 9001: 2008 certified



CONTACT US:

North America

ORBIT/FR Corporate Headquarters

506 Prudential Road
Horsham, PA 19044, USA
Tel: +1 215 674 5100 / Fax: +1 215 674 5108

MVG Inc.

2105 Barrett Park Dr., Suite 104
Kennesaw, GA 30144, USA
Tel: +1 678 797 9172 / Fax: +1 678 797 9173

AEMI

1320 Air Wing Road,
San Diego (Otay Mesa), CA92154, USA
Tel: +1 619 449 9492 / Fax: +1 619 449 1553

EMEA

Rainford EMC Systems Limited

Unit 400, Haydock Lane,
Haydock WA11 9TH, UNITED KINGDOM
Tel: +44 (0)1 942 296 190

MVG (SATIMO) Industries Headquarters

17, avenue de Norvège
91140 Villebon Sur Yvette, FRANCE
Tel: +33 (0)1 69 29 02 47 / Fax: +33 (0)1 69 29 02 27

MVG (SATIMO) Industries Bretagne

Technopole Brest Iroise, Z.I. du Vernis
225 rue Pierre Rivoalon, 29200 Brest, FRANCE
Tel: +33 (0)2 98 05 13 34 / Fax: +33 (0)2 98 05 53 87

MICROWAVE VISION Italy

Via Castelli Romani, 59
00040 Pomezia (Rome), ITALY
Tel: +39 06 89 99 53 11 / Fax: +39 06 89 99 53 24

ORBIT/FR Germany

Johann-Sebastian-Bach-Str. 11
Vaterstetten 85591, GERMANY
Tel: +49 (0)8106 99606 0 / Fax: +49 (0)8106 99606 77

MICROWAVE VISION Sweden

PO Box 35
44121 Alingsås Gothenburg, SWEDEN
Tel: + 46 31 402430 / Fax: + 46 31 402430

ORBIT/FR Israel

1 Gesher Ha-Ets St., P.O. Box 12096, 3877701
Emek Hefer Industrial Park, ISRAEL
Tel: +972 74 7130130 / Fax: +972 4 6247375

MICROWAVE VISION Corporate Headquarters

47, Boulevard St Michel, 75005 Paris, FRANCE
Tel: +33 (0)1 75 77 58 50 / Fax: +33 (0)1 46 33 39 02

Asia

MICROWAVE VISION LIMITED Hong Kong

Suite 702, 7th floor Cyberport 1
100 Cyberport Road
Pok Fu Lam, HONG KONG
Tel: +852 2989 6128 / Fax: +852 2989 6108

MVG India

N° 414 Cunnigham Road Level 4
Prestige Centre Point,
560052 Bangalore, INDIA
Tel: +917022981216

MICROWAVE VISION Japan

#101 Confort Murashi-Nakahara,
2-10-32, Shimokodanaka,
Nakahara-ku, Kawasaki-city
211-0041 KANAGAWA, JAPAN
Tel: +81 44 948 9301 / Fax: + 81 44 766 2775



For further information please visit:

www.mvg-world.com/emc
salesteam@mvg-world.com

