# MD news

M.D. Micro Detectors Magazine n°10 - 23/05/2017 - English Edition

# New ultrasonic sensors

10

# New metal-face and AC-DC inductive sensors

INDUSTRY 4.0

sps ipc drives
ITALIA PAV. 6 STAND H006

Micro Detectors
Italian Sensors Technology

# EDITORIAL

## ALWAYS LOOKING TO THE FUTURE

With this edition we are now in the double digits! M.D. News reaches its 10th publication. Since the beginning, this magazine has represented a strong sign of discontinuity with the past. The introduction of a magazine, completely realized in-house (except the printing) with the collaboration of many people working in M.D., has allowed us to open our doors to the outside world, showing all our partners who we are and what are we doing.
Paolo Masi, Vice- President of Finmasi Group and M.D. Detectors S.p.A. collaborates with the realization of this tool, which allows M.D. Mirco Detectors more and more visibility. Paolo, the son of Marcello, our President and the Group owner, is an important person in our organization and he represents continuity. In this issue there is an interview with him, which will allow those of you who do not know him to learn about his thoughts and vision.
2016 was another successful year, which confirmed the growth path we have taken since 2012. The M.D. Group strategy, based on the following principals:

- Human Factor
- Vertical integration
- Lean manufacturing
- New products
- Investments

is producing the expected results.
This route continues in all businesses and in all standpoints. But we are hungry to do much more and much better. These results increase our self-esteem and they feed a solid and virtuous strategic direction, but our mind-set does not change: we believe to be only at the beginning of a long journey and we still have a lot to do. We are working hard on a project which has medium-long term objectives, but which must constantly and necessarily produce results in the short term period.
In 2016 the sales turnover grew as well as the economic and financial results. We launched 12 new products and achieved 148 customizations. The last ones are a very important part of our business, but above all they allow us to differentiate ourselves from our competitors. Our size, our skills and our organization allow us to be faster and more flexible.
In 2016 we also continued a very consistent level of investment in new products, systems and equipment. Approximately 1.7 million euro of investments in tangible and intangible assets and a constant percentage of the cost of R & D higher than 7% of the total turnover, they are further tangible demonstrations of how we and our owners strongly believe in this project and we are consistent in practice.
The development of the Trainee Program in 2016 allowed 25 students a total of more than 3.200 hours of training time in our company. M.D. Micro Detectors always looks to the future and believes that in general, and even more in this historical moment, that it is important to contribute to the training of future professional generations according to certain values.
We are not afraid to say that we love working, we like to put a lot of passion and enthusiasm into our job. The job for us is a pleasure and it has a high moral content. We consider the workplace an essential element, which allows us to grow as people and as professionals and which allows us to realize our dreams and our ambitions. We believe that our duties have the same level of importance as our rights. And among our duties we believe that there is the one to leave to the future generations a better world than the one we received. We feel the duty to fight every day to be sure that these generations can at least have the same opportunities that our predecessors left us. And it is our duty and natural instinct to give the best of ourselves so that the business and industrial heritage created by our parents and grandparents before us is preserved and enhanced by our daily action.
2017 has started well from all points of view. We face the new industrial revolution (the era of the Industry 4.0), with enthusiasm, strength and concentration to maximize the results and be an integral part of this true evolution that will bring benefits to our business reality and which considers sensors, a key link in the chain. Let's see how far we will get.
In this issue you will find the focus on M.D. Micro Detectors new products.

- The "Metal Face" and "AC/DC" proximity switches: the proximity sensors range, that together with the photoelectric sensors represent for us in terms of quantity and tradition the history of our company, has been enhanced with two new lines particularly high performing in terms of robustness, versatility and technical features
- The CR0 area sensor reflex model: a new version in the new range of area sensors which has high application performances and which can have the IO-Link on board.
- The new range of ultrasonic sensors: the product which in past years has helped us register a high growth rate and which we have decided to further improve in order to increase the value and the application possibilities for our customers. The IO-Link version will be available as well

Some more important news: in the forthcoming months; there will be some exciting updates, regarding, in particular our photoelectric sensors and proximity sensors.
Finmasi Group recorded 2016 as the most positive year in its history. The hard work which, starting from our President, we are doing every day to practice our business and industrial strategy, is producing positive results.
I conclude with two quotes. The first one is from Fiammetta Di Vilio, who wrote on the September 2016 edition of Tecn'è magazine: "Who really wants to change the world, does not wait for anyone. They do. To innovate is difficult. We must take one step after another. With persistence and humility. Who wants to change must cope with deep resistance within organizations: the bureaucracy, the defence of personal power at any cost, the legitimacy of the established practices. " The other one is from the great Albert Einstein who said: "There is a stronger driving force than steam, electricity and atomic energy: the will."
Now, not wanting to appear what we are not, by that, conceited, we believe that in both quotes there is so much of that "will" that has moved our company in the last few years.

Enjoy the reading. Our organization is ready to let you know in detail about our new products and their applications.

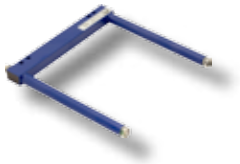
GIACOMO VILLANO
C.E.O.

# "flash news

**NEWS IN BRIEF FROM M.D.'S WORLD"**

## FORK PHOTOELECTRIC SENSORS FC5 AND FC6 SERIES: NEW MODELS.

The M.D. fork catalogue has been enlarged by adding new models. FC5 and FC6 series are now available with 30mm and 180mm depth slit detection.



## NEW MODELS FOR M18 CYLINDRICAL PHOTOELECTRIC SENSORS WITH DIRECT DIFFUSE AND ADJUSTABLE BACKGROUND SUPPRESSION

New models of FARW series are now available with background suppression and 300 mm pinpoint nominal sensing distance.

## NEW CULUS CERTIFIED MODELS

Our Area Sensors – CX series – have obtained cULus certification.

## NEW GENERAL CATALOGUE (ED. 01/2017)

The second edition of M.D. general catalogue is available in Italian and English
Corrected and updated with new products as well as enriched with Encoder range, it is available both in paper format and on-line.

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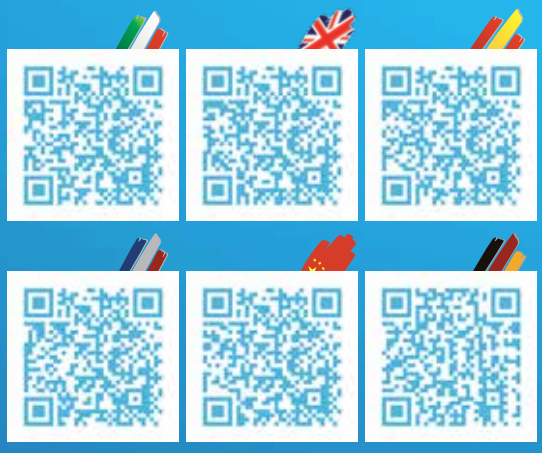
## DOWNLOAD AREA

MD News in Italian, English, French, Spanish, German And Chinese are available for download.

You can use both QR codes and download from our website.
Printed copies of MD News are also available in Italian, English and Spanish.




*Did you miss the first 9 MD News editions? Download them from our website www.microdetectors.com or ask for them through: info@microdetectors.com.*

# VIBRATION SENSOR

NEW!!

INDUSTRY 4.0

## VBR series
Vibration sensor

### characteristics

- Working frequency: 0...400Hz or 0...1200Hz
- Bus RS485
- Selectable analogue output
- Selectable full range: ± 2g, ± 4 g, ± 8 g, ± 16 g
- AISI316L stainless steel
- 3-axes MEMS

WARRANTY 3 YEARS

CE

# INCLINATION SENSOR

NEW!!

Micro Detectors

Italian Sensors Technology

## INC series
Inclination sensor

### characteristics

- resolution: 0,025°
- working range 0…360°
- bus RS485
- selectable analogue output
- adjustment: OFFSET, minimum angle, maximum angle
- AISI316L stainless steel housing
- mono-axial
- MEMS technology

WARRANTY 3 YEARS

INDUSTRY 4.0

CE

product catalogue ed. 01/2017

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# FOCUS ON THE FUTURE: INTERVIEW WITH VICE PRESIDENT PAOLO MASI

## PAOLO MASI, PLEASE, INTRODUCE YOURSELF:

I was born on December 10th, 1962, in Formigine, a town a few kilometers outside of Modena, where I actually still live. After primary and secondary school, I attended the first four years of a Technical Commercial Institute. "ISTITUTI FILIPPIN", in Paderno del Grappa in the Treviso Province. It was a very formative experience, despite the difficulty of being so far away from home at a very young age, with an understandable feeling of uneasiness and my separation from the family. But this very good school broadened my mind so early on and strengthened my character to the community life, which definitely affected the evolution of my personality in the following years.
Once I got my high school diploma in Modena, in 1981, I pursued my university studies first in economics and later in law without completing either.
Ever since my teens, communication and advertising have always been my great passion, and they would become my future job. I entered this world through some specific courses at the "TP" (Technical Advertiser Association) in 1985 and in 1990 in Milan, at the Academy of Communication. I started my professional experiences at the age of 22 in the hotel business at the Executive Hotel in Fiorano Modenese, a Finmasi Group company, and later in advertising agencies as a junior account and copywriter, in Padua and Modena. Before opening in 1999 my own communications agency in Modena, I was managing director from 1993 to 1996 for a company specializing in gifts and gadgets, with stores in shopping centers all over Northern Italy.
Over the past fifteen years, after having sold my part of the agency to my partner, I have continued in communications and advertising as a freelance account executive and copywriter, which was my initial training as well as writing, which has always been my passion.

## DESCRIBE YOUR CURRENT POSITION IN FINMASI GROUP AND M.D. MICRO DETECTORS

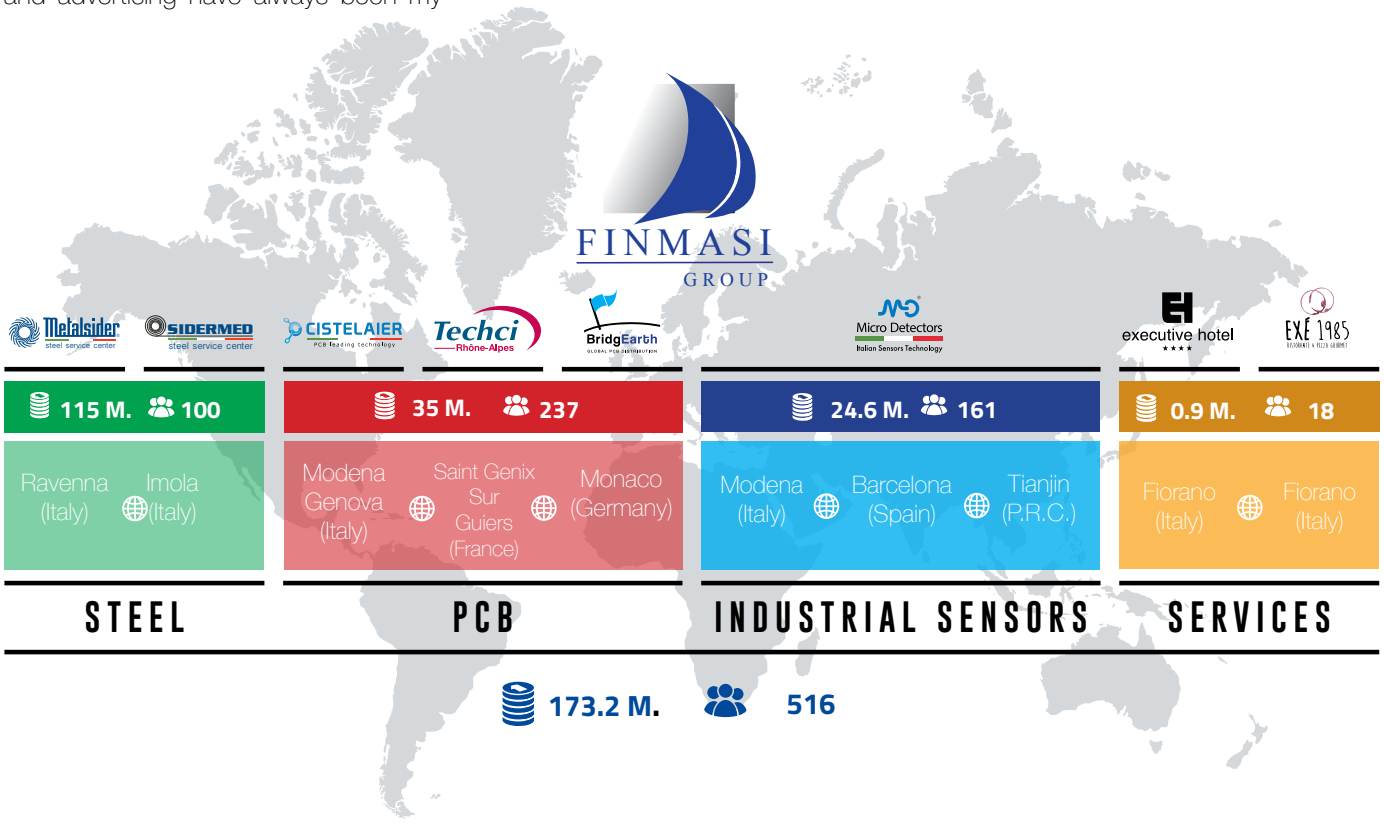
I am Vice President of both Finmasi Group and M.D. Micro Detectors, in addition to being a member of the Executive Committee of M.D. Micro Detectors. I am also Vice President and member of the Executive Committee in two other group companies, Metalsider and Sidermed.
I work continuously with the Marketing Communication Department of Finmasi Group, supporting the team on communication and marketing strategies related to other companies in our group. I also actively participate in strategic company decisions, with my constant presence at the Executive Committees of Finmasi Group which take place regularly with the President and CEOs of our companies.

## WHICH ARE THE ENTREPRENEURIAL VALUES YOU ARE INSPIRED BY?

I always believe that personal values are mandatory in order to be a valid entrepreneur. Which means, even as an individual professional or managing a company, policies, strategies and work organization must be implemented in perfect harmony with our own education and life philosophy. My core values, such as fairness, consistency, perseverance, commitment, determination, loyalty and dignity are the same which can be always found in the style and profile of the Finmasi Group. They outline our identity, beyond any rhetoric. The strength of these elements can be found in the synthesis of a very important expression which for us is essential: Corporate Ethics.

## HOW DO YOU CONSIDER THE SITUATION OF ITALY FROM THE ECONOMIC AND INDUSTRIAL POINT OF VIEW?

In this last period we have seen a country proceed at two different speeds: companies dealing in export have held



firm thanks to the foreign markets, while other companies have faced some difficulties on the domestic front. The GDP growth rate is at very low levels and consumption is not taking off, they are dealing with an infrastructure which is now fossilized and the economic solutions have not been sufficient to make our economy re-start compared to the growth parameters of some other European Union countries. It must also be pointed out that the fragmentation in thousands of small companies which is the Italian industrial reality, does not help in planning investments with micro activities worried about the current historical moment and the uncertainties of the political scenario. In this sense, we as Finmasi Group have tried to better address this situation through targeted strategies for each company of the Group and their relevant policy areas.
We continue to believe in ourselves and to face daily business challenges in this not simple domestic context. Convinced, however, that there is still space to grow and to see a country and system finally brought up to its potential.

## In your opinion, which actions should be taken to make industrial activity grow again and, more generally, the entrepreneurship in our country?

In Italy, industrial activities and not only, continue to be hampered by an excessive bureaucracy and by a high labor cost. The policy has worked on and off, often in a contradictory way depending on the government in power, implementing in this way rules which have been changed by politicians along the way. I firmly believe that the institutions must take their responsibilities in looking at the global reality and what has become "The World 4.0": we operate in a global context, where technological progress and the upgrade of private companies and the speed decision of those in charge to trace the economic guidelines, must go hand in hand. I am also convinced that protectionist choices overseas, combined with a closing off themselves of some European Union countries, are definitely wrong directions to take compared to how the world economy has been moving over the past five years. It is like trying to stop a moving train with a wall: the train cannot and must not be stopped. We must all get aboard. And allow the young to start their journey as entrepreneurs through major contributions to support new "start-ups". These contributions are only half of those paid by other European countries, such as Spain. Italy is a country with all the credentials to play the game that has already begun. We Finmasi Group are in the field with our best efforts: we expect the same from each institution and body responsible to make decisions which can enable a real re-start.

## In which direction are you driving Finmasi Group?

In each one of Finmasi Group companies, though operating in different sectors, we pursue constant growth and development objectives. We are oriented to the continuous pursuit of excellence through investments and industrial strategy and commercial policies aimed for making us always the protagonists on our respective markets. Each person of our Group, starting from the President, Marcello Masi up to the workers of each individual department, lives the job as a growth factor, with an active participation in achieving new goals. We are always ready to face new challenges, through continued efforts to consolidate the acquired positions, to conquer new spaces, to invent and patent new products (M.D. is an obvious example), we believe that teamwork is the trump card, each one of us ready to give his best in his role.
We have the bow in the right direction: a future in constant evolution, starting from our present. Finmasi Group is and will always be a real group. With our eyes constantly turned towards tomorrow.

## What is your vision for Finmasi in the short and mid-term period, and in the longer one?

As I mentioned before, our Group is operating in a historical and difficult economic context as perhaps never seen before in recent decades worldwide. Despite this, the results achieved give us encouraging responses and motivate us to continue on the chosen path. A way where the watchwords are efficiency, technology, quality, production capacity and service, applied to each company of the Group, although contextualized in each individual situation. My vision of Finmasi Group in the long period is that of a group that is more and more a protagonist on the global market in its

**PAOLO MASI**
VICE PRESIDENT OF FINMASI GROUP S.P.A. AND M.D. MICRO DETECTORS SPA


respective sectors, constantly searching for the highest level of performance and excellence and also moving towards new potential partnerships with other "players" of different product areas where the group operates. The coming years will be decisive for the world economy and particularly for the Italian one. We continue to invest and operate in Italy, despite the obvious difficulties, because we believe we can achieve the standards of a very modern country, in the industrial field. And we believe in a stronger Europe, more united with common real vital targets. A power not declined in economic differences and fragmentation of individual states, but united with a common political program and a continental strategy. So, no escape into easy isolationism, which is only a dead end, but we hope for a real and vigorous reaction of the citizens and the EU institutions, because only together we can win the huge challenge which awaits us in the near future.

## And in which direction is M.D. Micro Detectors going?

M.D. Micro Detectors is a constantly evolving company, with a wide range of products, well developed with an effective and well structured organization, lead by Mister Giacomo Villano, a tireless promoter of energy and determination. It is in constant growth both in terms of sales and new products, together with a large number of customizations. In fact, we export the most part of our production and, through our Spanish and Chinese subsidiaries, we have been for a long time now a strong presence in the related countries. M.D. often faces bigger competitors, winning the challenge on the field with flexibility, speed and service, typical features of a more agile structure, strengths which make our company highly competitive. I personally believe we will see this trend continuing to grow through investments and strategic decisions of the management, aimed for winning even more new customers and new market positions. And it is the same orientation that all other companies of the group have. It is part of the DNA of Finmasi Group and of the professionals who work in it every day.

## What do you like the most about the current M.D.? Which are, in your opinion, the strengths of this company?

I would start by the women and men who work here: a precious human heritage of skill and knowledge in every department. A close-knit and determined team, engaged and stimulated steadily and continuously by the CEO.
The implementation of the "Lean method" system in all manufacturing and assembly areas has been decisive , and in recent years it has radically transformed the patterns and production methods, allowing excellent performances in terms of lead times, rationalization of departments and consequent final results.
We can offer our customers a very wide range of products and an extensive catalogue in order to satisfy every need, also offering the possibility of co-design and customization to meet specific customer requirements.
Finally, "last but not least", I should also mention M.D. site, housed in a building with clean and modern lines, a clear signal of the future-oriented thinking of a company that is closely linked to the technological evolution. A plant often visited by our customers and suppliers, where it is possible to personally attend to production processes and see the assembly of our sensors in the different production lines.

## What does Paolo Masi suggest a young boy or girl approaching the working world today?

First of all, it is important to really know which direction you want to take. From adolescence, many girls and boys have a strong propensity to their future field of work.
So I would tell them to listen to their instinct and to continue their education after high school, in a field of study which can lead them towards a path which is consistent with their aspirations.
Today in Italy, with a youth unemployment

rate between 30 and 40%, young people often have to deal with a dramatic perspective as soon as they finish school. So the important thing for them is to focus on a specific field, even if they decide to only attend a professional high school without going to university.
The other thing I would advise is this: to resist as much as you can to the temptation to go abroad permanently for a job. To find other ways for professional realization in Italy may seem an impossible task, but there is still room for those who have the strength and talent to emerge with important features and innovative ideas. I think studying or doing a postgraduate course abroad is very useful, but our young people still have to believe (and to fight for this) that it is possible to change the situation in a country that needs them and their resources, their freshness and their insight.
M.D. opened its doors to a certain number of students, through partnerships with technical and professional schools in Modena and with the Politecnico of Milan, organizing traineeships and work experiences in the company. We believe in the future of a different Italy, and this future also depends on the "fuel" (to quote Giacomo Villano) that still many boys and girls have to offer.
So I would conclude by saying that we must never stop believing, never give up, even in front of difficulties, but always try to be prepared for opportunities seemingly more and more difficult and remote. This energy and this determination is within each of us.
My heart-felt hope is that the future generations will have the strength to change what needs to be changed, and recognize that it is their duty to do so, in a country where it is their right to find career satisfactions after all the sacrifices they have made.

# PROXIMITY SENSORS

# N E W METAL FACE

46 years in the world of automation, but, above all 46 years of meeting each and every single clients' requirements has enabled M.D. Micro Detectors to create not only a wide range of standard inductive sensors that can satisfy any application environment, but it has contributed heavily to increase the capacity and willingness to specialize in a range of products where a real difference is made with high technological levels, strength, endurance and performances.
Over the past few years, in fact, M.D. Micro Detectors has specialized in a series of inductive sensors defined "niche" (both for the performance and applications in which they are used) such as miniaturized sensors, cubic body models, for food applications or with analogue output, which have strengthened even more the identity of M.D. Micro Detectors on the market as a supplier able to follow its customers in all areas including the most extreme where precision and reliability are essential characteristics.
In this very context M.D. Micro Detectors has developed a new family of metal face inductive sensors, with bodies entirely in AISI 316L stainless steel. These sensors are created to withstand harsh environments due to their resistance to vibrations and shocks, which, in standard sensors, would otherwise suffer a negative impact on their proper functioning.
These products mechanical structures allows them to withstand washing with jets of water at high pressure and temperatures and any chemical agent normally used during the washing process, for example in the food and beverage industry. All this while maintaining an excellent temperature behaviour along the whole operating range of the sensors themselves, from -25 ° C to + 70 ° C.
Current available models are:

- M5, with 1 mm sensing distance (shielded): series FMD1
- M8, with 2 mm sensing distance (shielded): series FMES (miniaturized body) and series FME6 (short body)
- M12, with 3 mm sensing distance (shielded): series FMM6
- M18, with 6 mm sensing distance (shielded): series FMK6
- M30, with 10 mm sensing distance (shielded): series FMT6.

The new metal face sensors FM series are realized with ASIC technology, which guarantees:

- High thermal stability under all conditions of use within the field of work;
- High repeatability of the sensor characteristics;
- Easy installation.

The advantages of metal face technology are:

- high impact strength to shocks, caused by materials that can directly hit the sensor head; in particular:
  - FMT6 sensors have passed IK10 test (impact energy 20 Joule);
  - FMK6 sensors have passed IK08 test (impact energy 5 Joule);
  - FMM6 sensors have passed IK05 test (impact energy 0,7 Joule);
  - FME* sensors have passed IK05 test (impact energy 0,7 Joule);
  - FMD1 sensors have passed IK06 test (impact energy 1Joule);
- High resistance to surface abrasions;
- IP69K protection degree, as body and sensitive parts are one single metal part; the M.D. sensors were tested to certify to the highest degree the protection provided to exclude the intrusion of water, dust and oils in accordance to the standard IEC60539 test criteria. In particular, the IP69K test simulates washing conditions with water at a high pressure between 80 and 100 bar, a flow rate between 14 and 16 l/min and a temperature of 80 ° C;
- High resistance to corrosion, including exposure to saline mist. Thanks to the very nature of the material used to make the housing of the new FM family; M.D. Micro Detectors have decided, in fact, to use only AISI 316L stainless steel for the excellent mechanical and physical properties of this material making it suitable for demanding applications in harsh environments.
- high resistance to disinfecting agents, used in the food & beverage industry;
- resistance to high pressures; M.D.'s FM sensors were tested by mounting them in a hydraulic circuit and brought to a pressure of

## available models

| dimensions | connection | distance (mm) | PNP-NO | NPN-NO | PNP-NC | NPN - NC | PNP NO+NC | NPN NO+NC |
|---|---|---|---|---|---|---|---|---|
| M5* | M8 | 1 | FMD1/AP-3F | FMD1/AN-3F | FMD1/CP-3F | FMD1/CN-3F | | |
| M8 | | 3 | FMES/AP-3F | FMES//AN-3F | FMES//CP-3F | FMES//CN-3F | | |
| | | | FME6/AP-3F | FME6//AN-3F | FME6//CP-3F | FME6//CN-3F | | |
| M12 | M12 | 6 | FMM6/AP-3F | FMM6//AN-3F | FMM6//CP-3F | FMM6//CN-3F | | |
| M18 | | 8 | FMK6/AP-3H | FMK6/AN-3H | | | FMK6//BP-3H | FMK6//BN-3H |
| M30 | | 10 | FMT6/AP-3H | FMT6/AN-3H | | | FMT6//BP-3H | FMT6//BN-3H |
| M5* | 2 m PUR cable* | 1 | FMD1/AP-3A | FMD1/AN-3A | FMD1/CP-3A | FMD1/CN-3A | | |
| M8 | | 3 | FMES/AP-3A | FMES//AN-3A | FMES//CP-3A | FMES//CN-3A | | |
| | | | FME6/AP-3A | FME6//AN-3A | FME6//CP-3A | FME6//CN-3A | | |
| M12 | | 6 | FMM6/AP-3A | FMM6//AN-3A | FMM6//CP-3A | FMM6//CN-3A | | |
| M18 | | 8 | FMK6/AP-3A | FMK6/AN-3A | | | FMK6//BP-3A | FMK6//BN-3A |
| M30 | | 10 | FMT6/AP-3A | FMT6/AN-3A | | | FMT6//BP-3A | FMT6//BN-3A |

*coming soon

between 80 and 100 bar.
Thanks to the latest developments and launches in the field of inductive sensors, we are proud to announce that our main new products are, without any doubt, the miniaturized sensors M5 diameter (FMD1 series) and M8 miniaturized (FMES series).
The high technological content that M.D. continues to present, in particular, in the last few years, has contributed in fact, to the realization of a series of sensors with a full metal body, extremely small in size, high performing and which are above all, highly reliable. These products are certainly the excellence of the M.D product portfolio, but above all they give our customers the opportunity to reach more and more new industries and applications.

The main application fields in which the new M.D. Micro Detectors Full Metal sensors can be used are:

- food processing, thanks to AISI316L stainless steel body and to IP68/IP69K protection degree
- presence of saline mist (ports, marine,...), thanks to the high corrosion resistance of the stainless steel bodies;
- counting engine revolutions in hostile environments (wind turbines,...), with prolonged exposure to the elements;
- moving objects, even of large dimensions, which could result in oscillations or deformations of metallic structures.

M.D. Micro Detectors is always ready to try new areas and new applications, and we would like to invite you to try us as soon as possible in order to allow us to continue to grow with you and for you!


# M.D. TESTING

M.D. carries out strict controls to ensure their utmost efficiency, particulary under the worst working conditions.


The FM series sensors, in particular, have been submitted to specific tests demonstrating high resistance and efficiency of heads made in stainless steel AISI 316L.

Watch the M.D. Youtube channel to see the abrasion test.

**SALES, PRODUCT MARKETING, PRODUCTION:**
**WINNING TEAM WORK!**

# TESTED TO WITHSTAND EXTREME CONDITIONS

NEW!!

## FMD1 series

M5 inductive sensors with full metal housing

- Sensing distance: 1 mm
- Shock resistance degree: IK06
- Protection degree: IP68/IP69K
- M8 plug and cable exit
- Output logic PNP or NPN
- Output state NO or NC

## FMES series

M8 inductive sensors with full metal housing

- Sensing distance: 2 mm
- Shock resistance degree: IK05
- Protection degree: IP68/IP69K
- M8 plug and cable exit
- Output logic PNP or NPN
- Output state NO or NC

## FMM6 series

M12 inductive sensors with full metal housing

- Sensing distance: 3 mm
- Shock resistance degree: IK05
- Protection degree: IP68/IP69K
- M12 plug and cable exit
- Output logic PNP or NPN
- Output state NO or NC

## FMK6 series

M18 inductive sensors with full metal housing

- Sensing distance: 6 mm
- Shock resistance degree: IK08
- Protection degree: IP68/IP69K
- M12 plug and cable exit
- Output logic PNP or NPN
- Output state NO or NC

## FMT6 series

M30 inductive sensors with full metal housing

- Sensing distance: 1 mm
- Shock resistance degree: IK10
- Protection degree: IP68/IP69K
- M8 plug and cable exit
- Output logic PNP or NPN
- Output state NO or NC

CE IP69K

NEW!!

WARRANTY 3 YEARS

Micro Detectors

Italian Sensors Technology

# NEW
# A C - D C
# INDUCTIVE SENSORS
## YOUR HIGHWAY TO QUALITY!

The Inductive sensors have always represented the tradition and history of our company. The development of this family has in fact remained constant over the years and has brought us to the continuous improvement of this family both from the technological and production point of view, which is why this family is considered a true reference of excellence for all other technological families developed and manufactured in M.D.. Without a doubt, in fact, inductive sensors have been the first products to achieve a significant improvement thanks to the introduction of Lean principles which have further ensured effective service and shorter delivery times. The constant and relentless pursuit for continuous improvement, has contributed to the completion of this technological family with a large number of customizations able to meet our customers' applications. Reliability and robustness are the basic requirements of our products. This tireless talent to make even easier the work of our customers leads us to the realization of new products, which are more and more specialized and targeted. With this in mind M.D Micro Detectors is proud to present the new families of inductive sensors 2wires, with both AC and DC functioning.

Inductive sensors are used worldwide in many industries and it is for this reason that M.D. is always looking for solutions which, on one hand, enrich its technological heritage through the introduction of more advanced series (the last example is the new proxy families full metal presented in this MD News edition) and on the other hand they consolidated and enhanced the current portfolio of more standardized products. Which is why, after getting the idea from the existing VM, VK and VT families, M.D. Micro Detectors launched the new V3 family that has important technological improvements over the current package. The main difference is obviously related to the possibility of using the sensors both in alternate current and in continuous current and this option, in the M8 size, is unique in the panorama of industrial automation sensors to satisfy all the applications in which miniaturized products are required. Of course all standard cylindrical diameters from M12 to M30 are also available.
The new family of products is complete from all points of view, it is, in fact, foreseen:

| | V3E/**-** | | | | V3M/**-** | | | | V3K/**-** | | | | V3T/**-** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shape | M8 | | | | M12 | | | | M18 | | | | M30 | | | |
| Type | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Nominal Sensing Distance | 1,5 | 2,5 | 1,75 | 3 | 2 | 4 | 4 | 6 | 5 | 8 | 6 | 10 | 10 | 15 | 12 | 18 |
| Operating Distance | 0 | | | | | | | | | | | | | | | |
| Hysteresis | 1,2 | 2 | 1,4 | 2,4 | 1,6 | 3,2 | 3,2 | 4,9 | 4 | 6,5 | 4,9 | 8 | 8 | 12,2 | 9,7 | 14,6 |
| Standard target Fe360 | 1...20% | | | | | | | | | | | | | | | |
| Repeatibility | 4,5x4,5 | 7,5x7,5 | 5,5x5,5 | 9x9 | 6x6 | 12x12 | 12x12 | 18x18 | 15x15 | 24x24 | 18x18 | 30x30 | 30x30 | 45x45 | 36x36 | 54x54 |
| Operating voltage | 5% | | | | | | | | | | | | | | | |
| Inrush current | 20 -120 Vac / Vdc | | | | 20 - 250 Vac / Vdc | | | | | | | | | | | |
| Output current | 100 mA | | | | 200 mA | | | | | | | | | | | |
| Output type | Mosfet; NO | | Mosfet; NC | | Mosfet; Two Model for AC: NO or NC; one model for DC: NO / NC | | | | | | | | | | | |
| Leakage current | 1 mA RMS MAX. | | | | | | | | | | | | | | | |
| Switching frequency in AC | 25 Hz | | | | | | | | | | | | | | | |
| Switching frequency in DC | 3KHz | 1.5KHz | 1KHz | 750Hz | 2KHz | 1KHz | 750Hz | 500Hz | 800Hz | 600Hz | 600Hz | 500Hz | 450Hz | 300Hz | 350Hz | 250Hz |
| Power on delay | 200 ms | | | | | | | | | | | | | | | |
| Temperature range | -25°...+70°C | | | | | | | | | | | | | | | |
| Temperature drift | 10% | | | | | | | | | | | | | | | |
| Short-circuit protection | ● | | | | | | | | | | | | | | | |
| Overvoltage protection | ● | | | | | | | | | | | | | | | |
| LED | yellow (output energized) | | | | | | | | | | | | | | | |
| Protection degree | IP67 | | | | | | | | | | | | | | | |
| EMC | In conformity with the EMC Directive according to IEC 60947-5-2 | | | | | | | | | | | | | | | |
| Shock and vibration | IEC 60947-5-2 | | | | | | | | | | | | | | | |
| Housing Material | Nickel-plated brass | | | | | | | | | | | | | | | |
| Active head material | PA4T | | | | | | | | | | | | | | | |
| Connection | cable 2 m - Plug M12 | | | | | | | | | | | | | | | |
| Voltage drop | ≤8V AC / ≤9V DC | | | | ≤8V AC / ≤8V DC | | | | | | | | | | | |
| Minimum output current | 5 mA | | | | | | | | | | | | | | | |

- single and double distance model
- shielded and unshielded models
- models with cables and with connector; in the case of connector output have been foreseen both the M12 thread version and the ½"one.

All products are made with metal housing and are filled with resin filled to protect over the time the characteristics of quality and strength, essential elements for M.D. Micro Detectors.

Analyzing more in detail the technical characteristics it must be stressed:

- a power supply 20-120 Vac/Vdc for the M8 model and 20-250 Vac/Vdc for all other diameters
- a low leakage current (<1mA) with the consequent advantage of being able to drive high impedance loads; at the PLC entrance it is therefore present a very low supply current and the relationship between the load current and the leakage current is very high;
- output current of 100mA for M8 model and 250mA for all other models;
- all models, even the M8 are protected against short circuit in both functioning mode(AC and DC) and for this reason a possible wrong connection does not affect the operation of the sensor. The sensors of the new V3 families V3 are also well protected against overload.
- the new V3 sensors may function in AC / DC with a low voltage drop having consequently a greater voltage on the load;
- in DC operation, it is possible to change the operation from NO to NC (and vice versa) by simply reversing the power supply;
- the products with connector are laser marked;
- High brightness LED.

As always, M.D. looks for excellence and technological uniqueness even in standard products which are suitable for all industries and needs, in order to respond fully to the application of its customers.

## code description

V3 E A / R 0 - 1 A 8F

| | |
|---|---|
| V3 | AC/DC inductive sensors |
| E | M8 housing |
| M | M12 housing |
| K | M18 housing |
| T | M30 housing |
| 1 | Standard housing |
| R | AC mode: NO; DC mode: NO/NC |
| S | AC mode: NC; DC mode: NC/NO |
| 0 | 2 wires |
| 1 | Shielded, standard range |
| 2 | Unshielded, standard range |
| 3 | Shielded, long distance |
| 4 | Unshielded, long distance |
| A | 2 m cable |
| F | M8 connector |
| H | M12 connector |
| T | M12 connector for AC |
| W | M12 connector 1/2" 20UNF |
| Q | M12 connector 1/2" 20UNF for AC |
| 8F | PUR cable |

**VINCENZO GIUDICISSI**
**RESPONSIBLE FOR DEVELOPMENT OF PROXIMITY SENSORS**

# ALTERNATING CURRENT

## (DIRECT QUALITY)

NEW !!!

## INDUCTIVE SENSORS

# AC/DC

## V3E1 series

M8 inductive with AC/DC supply voltage

- Operating voltage: 20…250 Vac / Vdc
- Sensing range: shielded 1.75 mm, unshielded 3 mm
- NO/NC output selectable, if DC supplied
- Cable or M8 plug exit
- IP67 protection degree

## V3M1series

M12 inductive with AC/DC supply voltage

- Operating voltage: 20…250 Vac / Vdc
- Sensing range: shielded 4 mm, unshielded 6 mm
- NO/NC output selectable, if DC supplied
- Cable or M12 plug exit (dual keyway)
- IP67 protection degree

## V3K1 series

M18 inductive with AC/DC supply voltage

- Operating voltage: 20…250 Vac / Vdc
- Sensing range: shielded 6 mm, unshielded 10 mm
- NO/NC output selectable, if DC supplied
- Cable or M12 plug exit (dual keyway)
- IP67 protection degree

## V3T1 series

M30 inductive with AC/DC supply voltage

- Operating voltage: 20…250 Vac / Vdc
- Sensing range: shielded 12 mm, unshielded 18 mm
- NO/NC output selectable, if DC supplied
- Cable or M12 plug exit (dual keyway)
- IP67 protection degree

CE

GARANZIA 3 ANNI GARANZIA

SHIELDED AND UNSHIELDED MODELS

PROTECTED AGAINST SHORT CIRCUIT BOTH WITH DIRECT AND ALTERNATING CURRENT

Micro Detectors

Italian Sensors Technology

# ¡ UN GRAN GRUPO INTERNACIONAL !


Micro Detectors

Italian Sensors Technology

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08860 - Castelldefels (Barcelona)

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Quality, service, skill and speed are our watchwords for the Spanish customer's satisfaction. Micro Detectors Ibérica has been serving the Spanish market since 1991 and it is the only sensor manufacturing company with inventory stock in Spain.

# 一个优秀的国际团队


M.D. Micro Detectors Tianjin is our bridgehead on the large Chinese market. Quality, technology and service typical of Made in Italy sensors are available to the Chinese industry. Moreover, our coils are made with lean manufacturing methods and are 100% tested.

Micro Detectors

Italian Sensors Technology

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Fax: +86 022 23471913
info@microdetectors.com

# ENCODING SOLUTIONS

## MDI 40 A series

Miniaturized ø 42 mm encoder series for general factory automation applications

- 3 channel encoder (A / B / Z) up to 2500 ppr
- Power supply up to +30 VDC with several electronic outputs available
- Up to 220 kHz output frequency
- Cable output, connectors available on cable end
- 6 mm solid shaft diameter
- Mounting by clamping flange

## MDI 58 B / C series

Standard Ø 58 mm encoder series for industrial applications with high mechanical resistance requirements

- 3 channel encoder (A / B / Z) up to 2500 ppr
- Power supply up to +30 VDC with several electronic outputs available
- Up to 220 kHz output frequency
- Cable or connector output
- Solid shaft diameter up to 10 mm
- Mounting by synchronous, clamping flange

## MDI 63 A / D series

Standard ø 63 mm encoder series for industrial applications with high mechanical resistance requirements

- 3 channel encoder (A / B / Z) up to 2500 ppr
- Power supply up to +30 VDC with several electronic outputs available
- Up to 220 kHz output frequency
- Cable or connector output
- Solid shaft diameter up to 10 mm
- Mounting by synchronous or centering 2,5" square flange

## MDI 38 F / G series

Miniaturized ø 38 encoder series for general factory automation applications

- 3 channel encoder (A / B / Z) up to 2500 ppr
- Power supply up to +30 VDC with several electronic outputs available
- Up to 220 kHz output frequency
- Cable output, connectors available on cable end
- Metal cover for high IP mechanical protection
- Blind hollow shaft diameter up to 10 mm
- Mounting by stator coupling or anti-rotation pin

## MDI 58 F / G - 63 F / G series

Hollow shaft encoder series for industrial applications

- 3 channel encoder (A / B / Z) up to 2500 ppr
- Power supply up to +30 VDC with several electronic outputs available
- Up to 220 kHz output frequency
- Cable or connector output
- Blind hollow shaft diameter up to 15 mm
- Mounting by stator coupling, spring or anti-rotation pin


Micro Detectors

Italian Sensors Technology

product catalogue ed. 01/2017

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CE

WARRANTY 2 YEARS WARRANTY

# CR0 REFLEX: A LOOK AT THE IO-LINK MODELS

In issue 9 of MD News, we presented the new reflex area sensor CR0 model. This is one of the latest products launched on the market by M.D. Micro Detectors with the aim to provide its customers with more and more advanced and performing devices for the detection of the presence of objects in industrial environments.

Now M.D. is launching the IO-Link version of CR0 Reflex. With this latest product M.D. Micro Detectors completes the new range of CX area sensors using similar mechanical and developing a photoelectric array with reflector able to further expand the range of application solutions of the CX family products. A brief outline the main features of the CR0:

- height of controlled area: 69mm
- max. operating distance: up to 4.5m
- min. detectable object: Ø 6mm
- two types of teach-in: standard and precise
- Pitch of optics: 10mm
- Protection degree: IP67.

The most important innovation introduced in the CR0 is that models are now available with IO-Link communication. In fact, after the ultrasonic sensors, M.D. Micro Detectors continues its path in the world of Industry 4.0 offering a compact product to the market; high performing, remotely configured and able to report return to its user a series of useful information for monitoring the controlled area and the sensor itself.

The IO-Link version of CR0 will obviously be compliant with the smart sensor profile released by the IO-Link consortium in order to offer the user a "shared" vision and standardized functions. At the same time M.D. Micro Detectors offers its customers who use the new CR0 sensor, innovations and customizations on the IO-Link model which will allow for easy operation and the management of as much useful information as possible.

Essentially M.D. Micro Detectors has found the right trade-off between standardization and customization through:

- Introduction of specific additional features (Functions) inside the product;
- Introduction of standard functions (FunctionClasses) performing as foreseen by the IO-Link consortium;
- Realization of a specific IODD file (IO Device Description) for each product;
- The representation and transmission of measurement information based on ProcessDataVariables (PDV) and BinaryDataChannels (BDC);
- The definition of necessary parameters for the specific profile, such as setpoint and switching mode;
- The definition of standard information relevant to the device diagnosis.

As previously reported, M.D. Micro Detectors will provide, together with the product, the IODD files which the user will need to configure the CR0 and gather information relating to the application and also to the sensor for maintenance purposes. This macro structure of IODD files highlights the enormous potential of IO-Link technology and points out the obvious advantages of the solutions that M.D. Mirco Detectors offers. The IODD file will be substantially structured in 5 macro-sections:



## available models

| pitch (mm) | Controlled Area (mm) | sensing distance (mm) | response time (ms) | connection | poles no.s | input | outputs | model |
|---|---|---|---|---|---|---|---|---|
| 10 | 69 | 0,2...5 | 1,2 | M12 | 5 | no | b) IO-Link | CR0/0I-1V |
| | | | | | | d) NC/NO | b) PNP<br>c) NPN | CR0/0I-1V |
| | | | | | | | b) Push-Pull | CR0/0I-1V |
| | | | | | | no | b) PNP-NO<br>c) NPN-NC | CR0/0I-1V |
| | | | | | | | b) NPN-NO<br>c) NPN-NC | CR0/0I-1V |
| | | | | | | d) NC/NO | c) PNP | CR0/0I-1V |
| | | | | | | | c) NPN | CR0/0I-1V |

1. Identification, with information relevant to producer and product;
2. parameters, with information relevant to the sensor output type, the hysteresis level, the active beams, the teach-in type, etc.;
3. monitoring and diagnosis, with information relevant to the signal levels, the excess gain, the led performances, the sensors number of working hours, the temperature levels both in real time and the maximum reached during working phase, the supply voltage, the response time, etc.
4. process data, such as the above mentioned and information which can be exchanged back and forth with the PLC;
5. events; for example, all conditions that are then activated upon when reaching a set threshold such as temperature below or above certain levels, too low or too high voltage supplies, signal margin too low, etc.

To round off, an outline the main technical specifications of the product.

| | |
|---|---|
| Operating voltage | 15-30 V |
| Output type (model CR0I) | IO-Link |
| Output type (model CR0B) | 1 x PNP, 1 x NPN |
| Output type (model CR0T) | 1 x Push-Pull |
| Output type (model CR0Q) | 1 x PNP NO; 1 x PNP NC |
| Output type (model CR0R) | 1 x NPN NO, 1 x NPN NC |
| Output type (model CR0P) | 1 x PNP |
| Output type (model CR0N) | 1 x NPN |
| Current | |
| Output voltage drop @100mA | 1.5 - 3V |
| Nominal working distance | 0-5m |
| Working distance of reflector | 0.2-5m |
| Diameter of detectable object | 6-12mm |
| LED wave length | 617 nm |
| Opening angle | ±5° |
| Artificial light rejection direct/indirect | 20K /100K |
| Ambient light rejection | Sec. IEC 60947-5-2 |
| Models with standard protection | IP67 |
| Operating temperature | -10°÷55°C |
| Storage temperature | -25°÷60°C |
| Humidity | 95% |
| Vibrations and shocks | Sec. IEC 60947-5-2 |
| Housing material | 20 (front) x 36 |
| Groove for fixing | 2/10/6,5 |
| Closure screws | 2+2 |
| Model CR0I | 1xM12, 4p, male |
| Model CR0B | 1xM12, 5p, male |
| Model CR0T | 1xM12, 4p, male |
| Model CR0Q | 1xM12, 4p, male |
| Model CR0R | 1xM12, 4p, male |
| Model CR0P | 1xM12, 4p, male |
| Model CR0N | 1xM12, 4p, male |

**MAURO DEL MONTE**
**RESPONSIBLE FOR DEVELOPMENT OF AREA SENSORS**

# ULTRASONIC SENSORS: NEW UK1 SENSORS

Our company's secret and strength are the people and the enthusiasm that guides them in their daily activities. In recent years our ultrasonic sensors have grown in the wake of this enthusiasm and vigor, the same principles that in a very short space of time has overwhelmed our customers who continue to submit the most varied applications, and are particularly satisfied with the reliability of solutions given by this family. In this way we have been able to increase the customer confidence in our solutions, and we have continued ceaselessly to create new versions of a product that is more and more versatile, but above all, more and more appropriate for a variety of application fields. Hence the need to create a new family, rich in the selection of the various functions but also very basic in the number of available codes.

In the new UK1 series (standard M18) and basically in UT1, UT2 and UT5 series (M30 standard and large front) you will in fact be able to select 3 different functionalities on the same sensor simply by pressing the small teach button. The combination of signaling LEDs (green for the received echo, and 2 yellow LEDs for the 2 outputs activated) ensures that the choice has been made but above all indicates in a simple and intuitive way which functionality has been selected thanks to a new and easy programming menu.

The standard versions offered in our new ultrasonic sensors, UK1, UT1, UT2 and UT5, will be as follows:

- Digital single output (NPN or PNP - NO / NC) with synchronization function to avoid interference in applications where multiple ultrasonic sensors are used;
- Analog single output (I or V - positive / negative ramp) with synchronization function;
- Mixed Output (1 x Digital + 1 x Analog) with synchronization function;
- Dual digital output (NPN or PNP - standard window/ coded window/ hysteresis) with synchronization function;
- Dual digital output (NPN or PNP - Standard / Coded / hysteresis window) + 1 x analogue output (I or V) without double synchronization function.

All possible customizations, if not yet present in our already very large databases, will instead be handled on the basis of our customers' requests.

As ultrasonic technology is constantly changing in performances and above all, for its huge application capabilities, our R & D department has now created a firmware platform, which can be versatile enough to easily realize any

**ULTRASONIC SENSOR PRODUCTION LINE**
**THE WHOLE TEAM!**

COMPARING AN OLD AND A NEW UK1, IN ADDITION TO THE LASER MARKING, THE NEW TEACH-IN BUTTON ALLOWS AN EASIER ADJUSTMENT

customization.
In fact, thanks to the close collaboration between our technical department which will "simply" understand your requirement and the production cell, developed along the basis of Lean principles and especially following the "continuous improvement" ideal, M.D. is able to satisfy in an effective and highly professional way any of your requests, in which ultrasonic

technology is proposed as the most suitable solution.

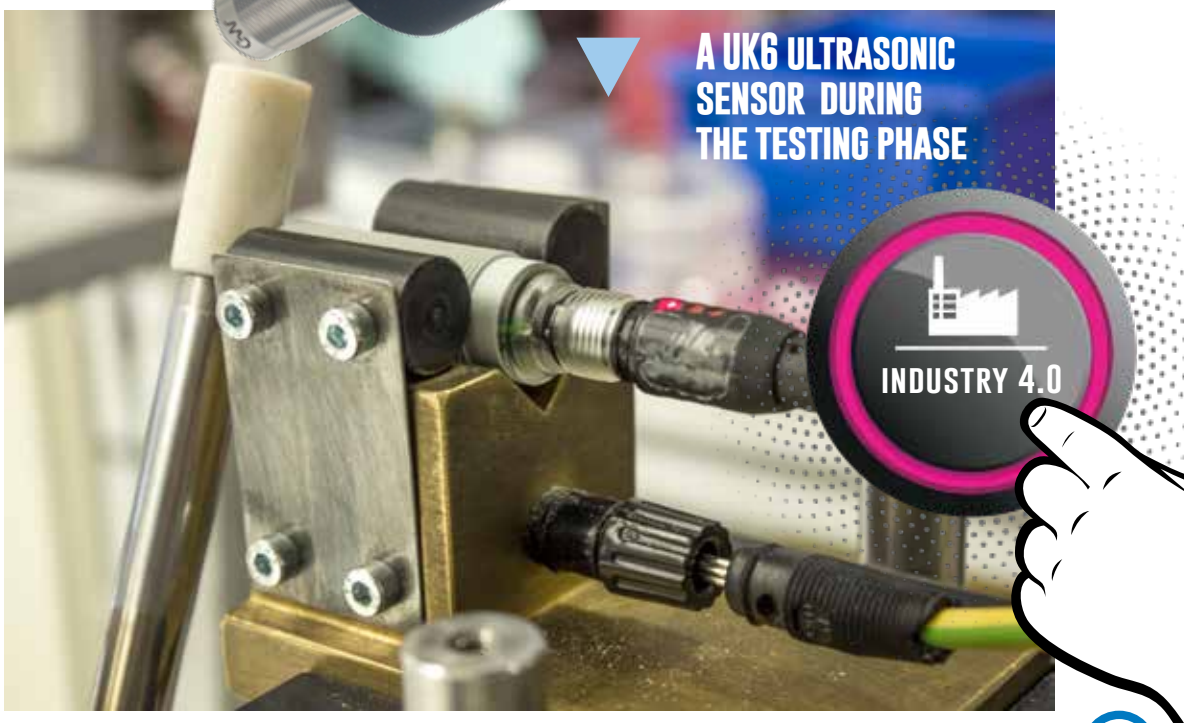
We would like to point out that in the new range of ultrasonic sensors, UK6, UK1, and very soon in the UT1, UT2 and UT5, in addition to the platform versatility ensuring greater stability and immunity to environmental disturbances, we can also offer an extended operating temperature range from - 20 ° C to + 70 ° C and above all, a voltage supply of 10-30 Vdc, even for analogue versions, which makes the ultrasonic sensors also fit for the mobile sector (such as agriculture, road or services).

The button teach-in has improved feeling in UK1 series allowing for an easier and more immediate use; we have also added the Factory reset and button lock functions, to prevent tampering.
While talking about innovation and continuous improvement, let's remind that the Ultrasonic sensors range was the first line to fully adjust to the new industrial evolution "industry 4.0.", both by a technical and an industrial point of view.

In fact, in our last issue we announced that the next step of this product development would have been the introduction of the IO-Link communication. From our decision to the actual realization we have really made strides. In fact, the IO-Link versions are now available both in short body (UK6) and in the M18 standard one (Uk1), as Smart Sensor Profile configuration. An even more simple and complete platform for the user.

Industry 4.0, a world that is developing in leaps and bounds, is mind blowing, and we are getting more and more involved especially in the innovative field of the ultrasonic sensors, with all the possibilities it entails.
The ease of access to services in the various production areas proposed by Industry 4.0 implies that the products used in the various lines always acquire new capabilities with new and more customized services following the customer's specific needs. This is the reason why M.D. has made available a number of functions within its IODD interface, in which the operator can always rely on a high-performance sensor and above all reliable and tailor made for his machine, once he has set up his configuration.

We invite you to contact us to receive further information, and our staff will be thrilled to introduce all the available and more adequate opportunities to solve all your needs.



# THE NEW ULTRASONIC WAVE


## OPERATING DISTANCE UP TO 8 M!

IO-Link

## UK1 and UKR1 series

M18 cylindrical direct diffuse & retro-reflective Ultrasonic Sensor UK1 with Teach-In button

- Models with adjustable digital output
- Models with analog voltage or current output
- 3 firmwares on the same product: coded output, adjustable hysteresis, window
- Adjustment of working area (window mode or adjustment on object mode) by means of Teach-in button
- Multifunction LED: output state, adjustment and selection of NO/NC and tilt of analog output
- Plastic or stainless steel AISI 316L housing, M12 5 pin plug exit or cable exit

## UK6 and UKR6 series

M18 cylindrical short body direct diffuse & retro-reflective Ultrasonic Sensor UK6 with Teach-In button

- M18 diffuse sensors with short housing
- Digital output
- Analogue output

## UT and UTR series

Sensori Ultrasonici cilindrici M30 con pulsante di Teach-In

- M30 ultrasonic sensor with standard housing and with large front with high performances and high sensing distances
- Models with voltage or current output: programmable slope to optimize resolution
- Adjustable working area (window mode or object mode) by Teach-in button on all models for a quick and easy installation
- Adjustable hysteresis function: models with double digital programmable output specific for level detection
- Two multifunction LEDs: orange LED for adjustment procedure and output type and green LED for target alignment

## UT5 series

M30 Cylindrical Ultrasonic Sensors with Teach-In button

- Large Front M30 ultrasonic sensor with high performances and High detection range capacity
- Models with mixed digital and analogue outputs to better optimize the item numbers.
- Working area Adjustment by Teach-In button
- Adjustable Hysteresis Function: Model with double digital output adjustable specifically on detection level application
- 2 LED indicators: LED

## FC8 series

Ultrasonic fork sensors for label detection

- Ultrasonic fork sensor for transparent labels, any opaque material with connector
- M8 4-pole
- Teach-in models with dynamic and remote teach
- Ultrasonic technology
- Small size easy to locate; aluminum case
- NPN and PNP, Lo/Do total configurable
- Width slit detection 3 mm; depth slit detection 69 mm
- Maximum switching frequency 1,500 Hz

Micro Detectors

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# NEW FRONTIERS: A DREAM, A PROJECT, AN ADVENTURE

*October 2016 saw the start of a collaboration between our company and Milan Polytechnic, as part of the Master of Science in Management Engineering under the guidance of Professor Alberto Portioli Staudacher. The first phase of this project ended with mutual satisfaction in February 2017. This can be seen as a successful example of how the training of future professional generations can intersect with mutual profit, while considering also the practical and strategic needs of companies. Here, the three students who worked on the project, Giovanni Prencipe, Marco Aquino and Surush Arafati, will discuss how the project developed.*

"Enthusiasm, passion, curiosity and initiative: these are the key words that have guided our adventure in M.D. Micro Detectors for four months. A story that began in early October, when three students of the second year of the Master of Science in Management Engineering at Milan Polytechnic, accompanied by their academic tutors got in touch with this fantastic company for the first time. The words used by the CEO, Giacomo Villano, when he warmly welcomed us are still fresh in our minds and how he described the salient features of the project which we would have dealt with in the following months. Words that clearly revealed the strategic importance of the project itself and the enthusiasm and the passion with which it was conceived and structured. Aware from the outset of the complexity and scope of work to be done, we emerged ourselves in the project and unleased our curiosity, to discover a universe hitherto unknown: that of industrial sensors. Thanks to the untiring action and support offered by Jessica Galantucci, Sales Manager and company tutor for the project, Roberto Bosani, R & D Manager, and Claudio Guerzoni, previous Operations Manager, we were made to feel perfectly integrated into the company and emotionally involved in the implementation of an important project under a strategic point of view that spaned across all business areas: R & D, Operations, Sales and Marketing, Quality, Finance and Management Control.

To conclude, at the end of this first phase of the project, it is important to emphasize the essential role that this experience has provided for the personal and professional growth of each of us. We felt from the beginning an integral part not only of a company, but of a great family. A family in which everyone plays perfectly their roles and strives for the overall development and growth. We fell in love with this project, which required a lot of effort and, at the same time, has allowed us to apply at 360° all the knowledge acquired during these years of academic studies. We worked closely with top management and shared difficulties, anxieties and concerns with them, but also joys and satisfaction for results achieved. We are honored and pleased to have made our small contribution to such an ambitious and strategically important project. We hope we have left a good memory of us and of our work. We thank the President of Finmasi Group, Marcello Masi, for his warm welcome and for the great opportunity he granted us. Quoting his words, it is possible to say that in life a few trains pass through and many of them will be in poor condition. This experience has been, for us, a beautiful train, under many points of view: professional, human and personal. It represents the first brick to building our careers. We thank Giacomo Villano, Jessica Galantucci, Claudio Guerzoni and Roberto Bosani for their professionalism and spirit of self-sacrifice which have guided and supported us. It is a very close-knit team with a high professional profile, but also of great human warmth.

Special thanks to Prof. Alberto Portioli Staudacher, for allowing us to live this extraordinary experience and learn about such an inspiring and dynamic reality."

FROM LEFT TO RIGHT: ROBERTO BOSANI, SURUSH ARAFATI, GIOVANNI PRENCIPE, GIACOMO VILLANO, MARCO AQUINO, JESSICA GALANTUCCI & CLAUDIO GUERZONI


# BORN IN ITALY
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IAS
SHANGHAI
7 - 11 NOVEMBER
2017

SPS IPC DRIVES
NUREMBERG
28 - 30 NOVEMBER
2017

SIAF
GUANGZHOU
4 - 6 MARCH
2018

Hispack 2018

HISPACK
BARCELONA
8 - 11 MAY 2018

30 BIEMH

BIEMH
BILBAO
28 MAY - 1 JUNE
2018

Micro Detectors
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# SUPPORTING ITIS – FERMI SCHOOL: SPECIAL PROJECTS

Starting from late 2013, M.D. Micro Detectors has intensified its relations and cooperation with technical schools and universities. There are various activities and different objectives that we intend to pursue. First of all, we want to support the training of the next generation of engineers and provide students with a qualified contact with the world of work. Set activities are producing mutual satisfaction and success and this is why, from year to year, the number of internship hours has increased: in 2016 we have offered more than 3,200 hours compared to the 2,500 hours of the previous year. Here we describe two of our experiences with ITIS Enrico Fermi di Modena.

In the context of industrial automation teaching, as suggested by Professors Sanzio Manzini and Erio Orlandi, a handling system was developed (palletizers) both for hardware and software design with the aim to train students to solve the applications they will actually face in the work place. The first project core was a manipulation system X-Z able to pick up objects from a conveyor belt and to place them onto a second conveyor. To obtain a complete cycle the system was developed with a second X-Z manipulator that intercepted the objects and placed them on the feed chute of the first conveyor. The belts were then driven by stepper motors and each operation was performed through a pneumatic system, including picking up the objects with the use of suction cups. The unit's operating sequence was controlled by a PLC that received signals from the sensors installed in the system

The equipment was completed with a perimeter security system created by light barriers together with the sensors installed in the plant, both of which were offered by M.D. Micro Detectors.
This equipment was designed to introduce the students of the 4th and 5th year to an industrial programming language, to the basics of pneumatic, to the characteristics of sensors, electrical and pneumatic actuators and finally to introduce them to the security problems related to an installation.
The students analized the various components and had the possibility to realize different subprograms that were tested on the installation and which, once recorded in a suitable sequence formed the complete operating program.
The second special project that we would like to present is Roboino, a project of Open Source teaching with the aim to bring young people and adults to electronics, to coding and software development.

The project is really suitable for anyone: for people who approach electronics for the first time, up to those with more experience and want to enjoy the develolment of hardware and software in a great and amazing product..
Roboino is a perfect teaching tool as it covers the coding program for middle and high school and it can be adopted as a multidisciplinary project in the fourth and fifth year of a technical institute for electronic / automated disciplines. The product is a kit for realizing a multifunction robot; programmable, Open Source and that can be modified by the user.

TRAINEE PROGRAM

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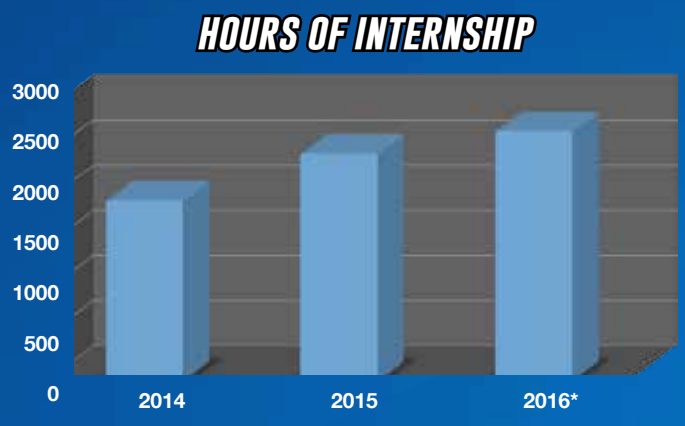
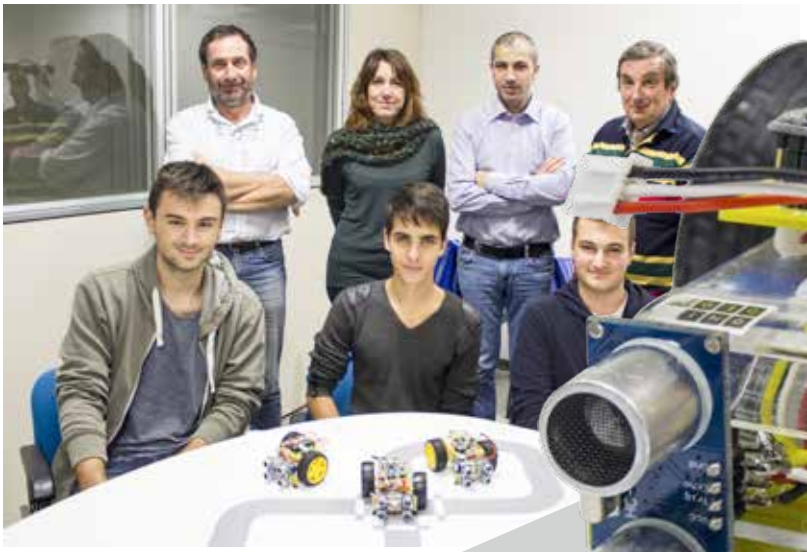
| | 2014 | 2015 | 2016 |
|---|---|---|---|
| number of interns | 15 | 21 | 22 |
| hours of internship | 2.000 | 2.520 | 2.768 |




*data updated at 31/07/2016

Through this project, a team of students from ITIS Enrico Fermi institute were able to participate at the Maker Faire 2016 in Rome (a family-friendly event full of inventions and creativity celebrating the culture of "do it yourself" in the world of technology that is the basis of the "makers activity"), this is the European edition of Maker Faire, an event created to satisfy an audience of curious people of all ages who want to know and experience the inventions created by their inventors.

This experience allowed the students to deal with projects, ideas and colleagues coming from different backgrounds and enriching their experience on the field. Also, during the event in Rome, thanks to the atmosphere of innovation and development, the idea of a start-up was born; Roboino will now have the task of creating a new educational model in the name of " Learning by Doing ".
The project is growing and during the next few months, we will introduce Bluetooth technology to interface with the robot, ultrasonic sensors and photocells to improve the mobility and reliability of engines and finally also with an encoder which will allow for tracking and to have perfect control of Roboino's movements.




**TWO STUDENT TEAMS FROM ITIS FERMI SCHOOL WHO COOPERATED WITH M.D..
TOP PICTURE THE TEAM THAT PRODUCED THE ASSEMBLY LINE.**

**BOTTOM PICTURE, THE TEAM THAT DEVELOPED THE ROBOT TOGETHER WITH PROFESSORS AND THE M.D. R&D.**

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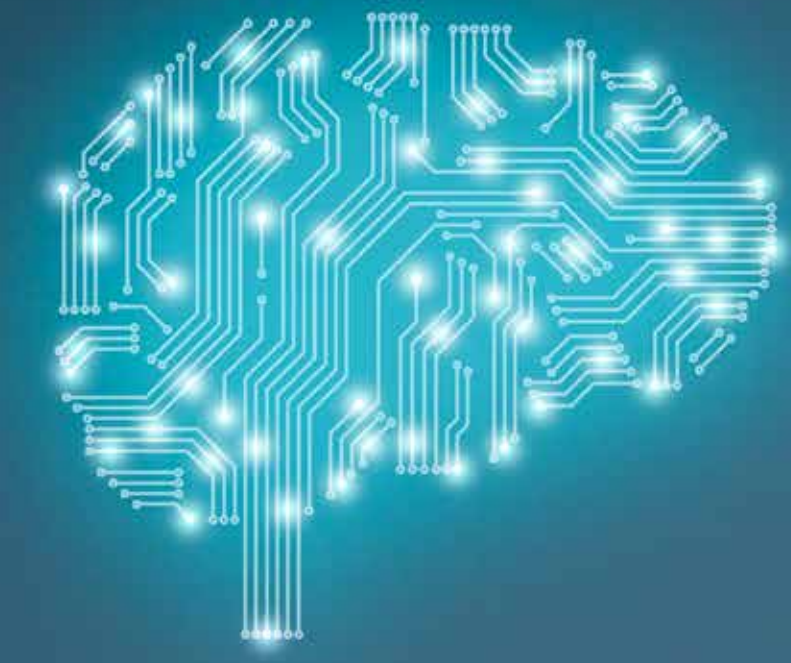

# YOUR BUSINESS OUR KNOW - HOW

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- Ultrasonic Sensors
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- Encoders
- Accessories
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