M.D. news

M.D. Micro Detectors Magazine n°9 - 22/11/2016 - English Edition

1977

M.D. LAUNCHED THE FIRST M18 PHOTOELECTRIC SENSOR IN THE WORLD

NEW PRODUCTS:

- AREA SENSORS – REFLEX TYPE
- ENCODER
- PROXIMITY METAL FACE
- CAPACITIVE SENSORS

sps ipc drives

Electric Automation
Systems and Components
International Exhibition

Micro Detectors

Italian Sensors Technology

EDITORIAL

LET'S MAKE THE FUTURE

GIACOMO VILLANO
C.E.O.

The cover of this issue illustrates an important piece of our history. One of those events that change the fate of so many people. The one shown on the cover is the first photoelectric sensor worldwide with cylindrical housing diameter 18, that our Company realized in 1977. Then we were at the beginning of the Third Industrial Revolution, when the introduction of the computer and electronics allowed a big jump forward in the automation production processes, and it started a radical lifestyle process change. Probably a lot of people do not know about it, but M.D. Micro Detectors (who at the time still had its name Diell) was the first to launch that shape, which then became a standard for the sensor market.

It is important to know our own history, fully understand our roots, and to have awareness of our excellences and limitations, to be conscious of our strength and figure out where we need to improve. To learn from our mistakes so that they will be no longer repeated. This is critical to project ourselves into the future and to build on solid and sustainable foundations.

And towards this future we set off with courage, decision and sometimes boldness. Aware that nothing is easy, but that each of us can contribute to build a future that is worth to live.

We want to support giving an industrial perspective to this country. We want to help providing continuity and enhancing a technological heritage and work culture which comes from an ultra-centenary tradition. We must defend our great industrial and entrepreneurial tradition, our economic identity to deliver them, enhanced, to our future generations, so they could defend them and exploit them in turn. We have received from our great-grandparents, grandparents and parents a huge economic, technical and business asset, that for some time someone is consciously and unexpectedly destroying. Who are we to afford such a mess, and pass on to our children a heritage largely impoverished, from all points of view, with respect to the one which we have received from our parents? Where is our pride?
M.D. Micro Detectors is a group living in a global world and achieving the majority of its business volume in overseas markets. Living and working in the World we can say that the industrial and entrepreneurial fabric formed in Emilia-Romagna and in other Italian regions, it has technological economic and professional highest level values and it did not really have anything to envy to the most advanced areas of the world .

Italy is not only culture, art, food, tourism and fashion, but also science, technology, industry and entrepreneurship. All activities which we can perform at the highest level and which we should exploit more and more. All activities for which we have demonstrated the ability to play with brilliance and creativity, with sacrifice, hard work and sense of duty.

With the development of new products, particularly the ones with IO-Link on board, and with the new organization, which led us to a considerable increase of productivity and efficiency, also M.D. Micro Detectors is entering as protagonist in the Fourth Industrial Revolution. Industry 4.0 is no longer a slogan, but a new evolution in the industry, where the sensors and the organizational systems hold and will play an increasingly important role.

Talking about the Future and future generations, in the last three years we have developed a lot of connecting and supporting activities in high school. As you will read in detail in this number, we are investing time and resources, gradually increasing, in order to support the educational activities of the technical schools of our district. We strongly believe in the active role which companies can play in order to open to the students a window on the world of work. Companies can play an important role in the educational development of future working generations. Not to neglect the fact that those activities are for companies: an opportunity to learn about profiles to integrate in their organic. The year 2016 is drawing to a close. It has been another busy year but positive. The path of growth of M.D. Micro Detectors continues. It continues with the same vigor the implementation of both the products plan, and the one of investments.

Even Finmasi Group confirmed in 2016 a further improvement in results and performance. The Group-wide set strategy is producing the expected results, and the achievement of them requires to our people, first of all, our President Marcello Masi, to work hard. What does all this mean for us? A confirmation that the road taken is the right one and that the business approach is needed to address the difficult times which we are actually facing. But our mental approach is always the same: nothing is yet done for us and everything is still to be done. We are just at the beginning: the best is yet to come.

AREA DOWNLOAD

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, French, Spanish, German and Chinese.

Did you miss the first 8 MD News editions? Download them from our website w w w.microdetectors.com or ask for them through: **info@microdetectors.com**.

NEW CATALOGUES

The new general catalogue as well as the Encoder catalogue are available. In Italian and English, ask for them as paper version or download as electronic format.

GENERAL

ENCODER

ENCODER:
RESOLVING INDUSTRIAL AUTOMATION APPLICATIONS IS OUR PRIMARY COMMITMENT

M.D. Micro Detectors, leader in design, development and manufacture of photoelectric, ultrasonic, inductive, capacitive and area sensors as well as safety products in order to be recognized as a complete product supplier for all the typical industrial automation shop floor applications offering a more complete range, is glad to introduce a new optical incremental encoder series.

Working principle

An encoder is a rotary transducer that converts an angular movement into a series of electrical digital pulses. If associated to racks or endless screws, these generated pulses can be used to control angular or linear movements. During rotation, electrical signals can be elaborated by numerical controls (CNC), programmable logic controls (PLC), control systems, etc. Main applications of these transducers are: machinery, robots, motor feedback, measurement and control devices.

The encoder is formed by:

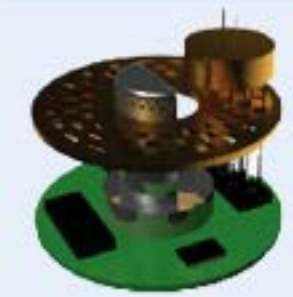
- Mechanical interface
- Code wheel (or magnetic actuator or linear scale)
- Optoelectronic receiver or magnetic sensors
- Electronic interface.

Encoders use two main technologies to detect the signals:

- Photoelectrical or optical scanning
- Magnetic field variation.

In M.D. Micro Detectors encoders, the angular movement transduction is based on the photoelectric scanning principle. The reading system is based on the rotation of a radial graduated disk formed by opaque windows and transparent ones alternated. The system is perpendicularly illuminated by an infrared light source.

Picture 1

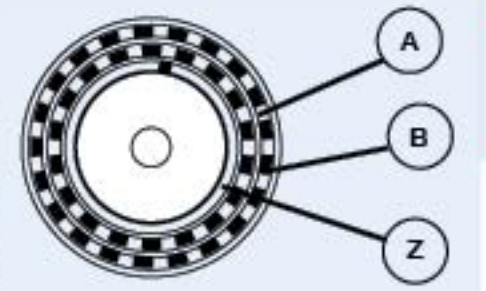


The light projects the disk image on the receiver's surface which is covered by a grating called a collimator having the same disk steps. The receivers transduce the occurring light variations caused by the disk shifting and convert them into their corresponding electrical variations. Electrical signals, raised to generate squared pulses without any interference, must be electronically processed. The reading system is always carried out in differential modality, that is comparing different signals nearly identical but out of phase of 180 electrical degrees. That in order to increase quality and stability of output signals. The reading is performed by comparing the difference between the two channels, to remove the noise known as "common mode", because signals are overlapped in equal way on each wave.

Incremental encoder

The incremental encoder usually gives two types of squared waves out of phase of 90 electrical degrees. They are usually called channel A and B. The first channel gives information about the rotation speed while the second, basing on the state sequence produced by the two signals, provides the direction of rotation. A further signal, called Z or zero channel, is also available. It gives the absolute zero position of the encoder shaft. This signal is a squared pulse with phase and width centered on A channel.

Picture 2



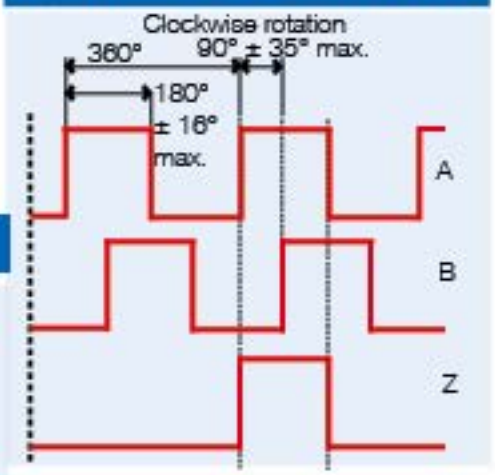
The incremental encoder accuracy depends on mechanical and electrical factors. These errors could be: grating division, disk eccentricity, bearings eccentricity, electronic reading and optical inaccuracy. The measurement unit to define encoder accuracy is the electrical degree. It determinates the division of the impulse generated by the encoder: 360 electrical degrees correspond to the mechanical rotation of the shaft which is necessary to carry out a complete cycle. To know how many mechanical degrees correspond to 360 electrical degrees the following formula has to be applied:

360° Electrical= (mechanical 360°/ ((n° pulses)/turn)

The encoder division error is given from the maximum shifting shown in the electrical degrees of two consecutive edges. This error exists in any encoder and is due to the above mentioned factors. On M.D. Micro Detectors encoders pulse error is ±18° and max. on full operating range, which corresponds to a ±10% from nominal value. Regarding the 90 electrical degrees phase relation between the two channels, it differs in ±35 electrical degrees max which corresponds to ±10% respect to signal period.

Mechanical interface

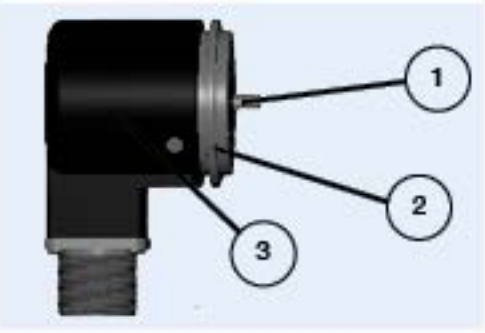
Picture 3
(Graphics of incremental channels relevant to A, B and Z)



The mechanical interface consists in all those components that allow the coupling of the encoder to the machine

or device of application, which are:

Picture 4



1. An axle, connected to the shaft of the machine in rotation, designed in accordance to the type of fixing: solid shaft, blind and through hollow shaft;
2. A flange, which fixes and adjusts the encoder to its support;
3. A case (or body), which contains and protects the disc and the electronic components.

Elastic couplings can also be employed to adapt the fixing between the motor shaft and the encoder.

Picture 5

Solid shaft

Blind hollow shaft

Through hollow shaf

ELECTRONIC INTERFACE

The electronic interface consists in all the input and output components that allow both the power supply and the transmission of electric pulses of the encoder.

In the incremental system, the transmission of output signals occurs through one or more channels and could be of different kinds:

- NPN and NPN open collector
- PNP and PNP open collector
- Push-Pull
- Line driver

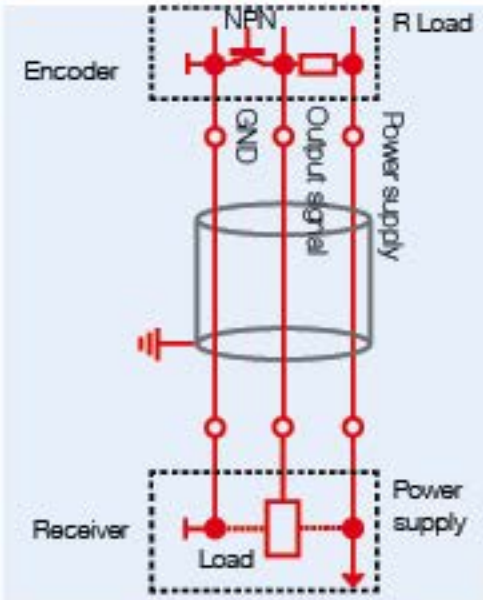
In the absolute system, the transmission of output signals could be parallel, serial (SSI), or of field-bus type (Profibus DP communication protocol for example).

INCREMENTAL ENCODER ELECTRONIC INTERFACE

NPN AND NPN OPEN COLLECTOR

This type of electronic output is composed by a NPN transistor and a pull-up resistor used to match the output voltage to the power supply when the transistor is off. It has low saturation levels at 0 Vdc and close to 0 at the positive. It is proportionally influenced by the cable length, pulses frequency and by the load, so these factors should be considered to meet the application's needs.
The open collector variant differs since it has no pull-up resistor, therefore the collector of the transistor is free from the constraint of the encoder power supply,

Figura 6 (NPN Scheme)

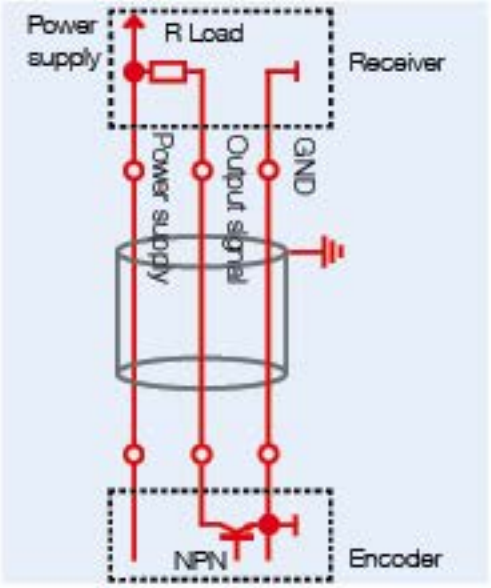


allowing to obtain signals with different voltage.

PNP AND PNP OPEN COLLECTOR

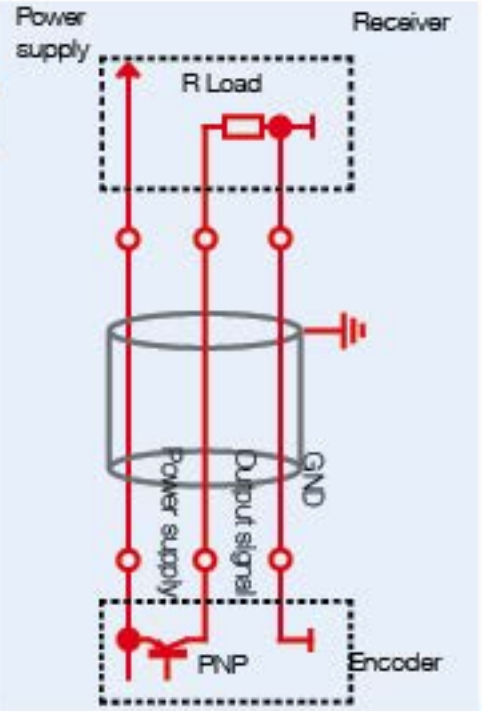
Main characteristics and limitations of the PNP interface are the

Picture 7 (NPN Open collector Scheme)

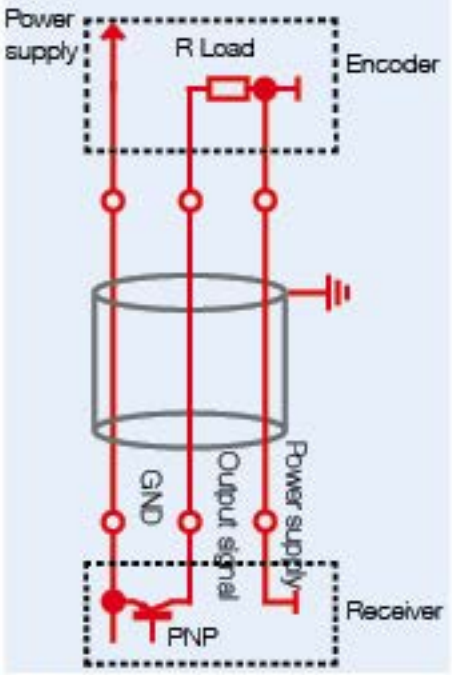


same as for NPN electronics. The main difference lies in the transistor, which is a PNP type. The resistor, if present, is a pull-down one. Therefore, it is connected between the output and 0V.

Picture 8 (PNP Scheme)



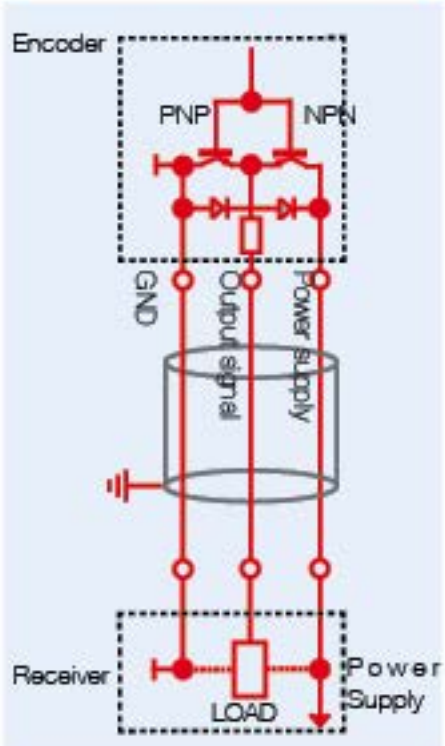
Picture 9 (PNP Open collector)



PUSH-PULL

In NPN or PNP electronics the major limitations are caused by the resistor, which works with a much higher impedance than a transistor. To overcome this issue, the Push-Pull circuit uses a complementary transistor, so the impedance is lower for commutation to positive and to zero. This solution increases frequency performances allowing longer cable connections and an optimal data transmission even at high working speed. Saturation signals are low, though higher than in NPN and PNP electronics. It is anyhow possible to apply indifferently the Push-Pull electronics also to NPN or PNP receivers, which is also TTL compatible (5 Vdc power supply).

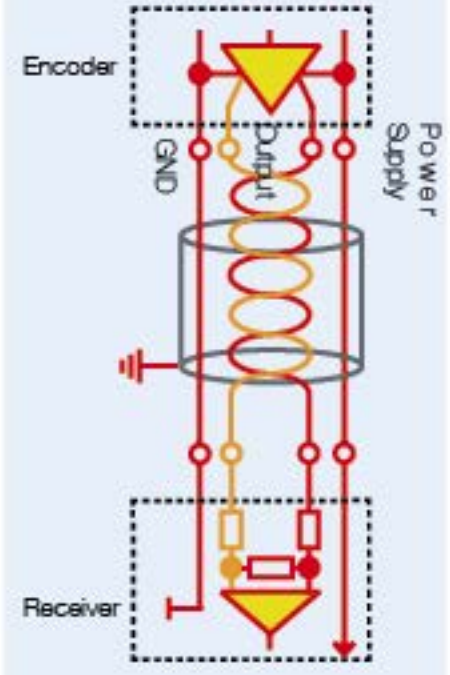
Picture 10 (Push/Pull Schema)



LINE-DRIVER

The Line-Driver output is employed when operating environments are particularly exposed to electrical interferences or when the encoder is quite far from the receiver system.
Data transmission and reception work on two complementary channels, so the noise caused by the cross-talk from other cables is reduced. In Line-Driver instead, signals are transmitted and received in «differential» way; in other words, the communication works based on the difference of voltage between complementary channels.
This type of transmission is used in 5 Vdc systems and is compatible also with RS422; it's also available with power supplies up to 24 Vdc for harsh environments applications.

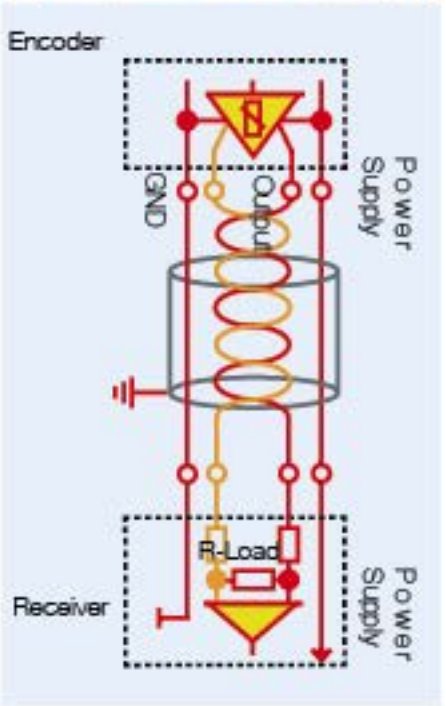
Picture 11 (Line-Driver Schema)



OUTPUT STAGE PROTECTION

A highly integrated driver is used to protect outputs from short circuits. This solution is based on an active sensor which controls instantly the temperature reached by the element to be protected. In this way, protection is very effective.Moreover, it ensures a constant protection against repetitive and permanent short circuits, which is why it is strongly suggested for heavy duty applications.It's available for Line-Driver and Push-Pull electronics.

Picture 12
(Protection from short circuits schema)



M.D. MICRO DETECTORS ENCODER OFFER

The new MDI series is DIRECT REFLECTION optical working principle based. Differently from classical TRANSMISSION based, these ones are definitely better in respect of transmission frequency, resolution, reliability, robustness, response time, temperature stability and much more compact.

M.D. Micro Detectors offer is made by three SOLID SHAFT incremental encoder families:

- MDI40A
- MDI58B/C
- MDI63A/D

Together with three HOLLOW SHAFT incremental encoder families:

- MDI38F/G
- MDI58F/G

- MDI63F/G.

Each product line is provided with several different models, depending on resolution, flange type, flange dimension, electronic output logic and output type.

MDI40A Series

MDI40A series is made by solid shaft models, 42mm dimension with Flange Type A with 6mm shaft dimension. Models with and without ZERO PULSE are available together with models Push-Pull or Line Driver output logic. Standard mechanical protection is IP54 but models with IP66 protection are available equipped with special bearings All MDI40A are with standard 0,5 m radial cable exit. Longer cable models are available on demand.

MDI58B/C Series

MDI58B/C series is made by solid shaft models, 58mm dimension with Flange Type B and Type C with 6mm and 10mm shaft dimension. Models with and without ZERO PULSE are available together with models Push-Pull or Line Driver output logic. Standard mechanical protection is IP54 but models with IP66 protection are available equipped with special bearings.

MDI58B/C series provides:

- Standard 1,5 m radial cable exit versions. Longer cable models are available on demand.
- 7-poles Type M Amphenol MS3102-E-16-S (for Push-Pull models) or 10-polse M Amphenol MS3102-E-18-1 (for Line Driver models) RADIAL or AXIAL MILITARY (MIL) Connector.
- 5-poles (for Push-Pull models) or 8-poles (for Line Driver models) RADIAL or AXIAL standard M12 connector;

MDI63A/D Series

MDI63A/D Series
MDI63A/D series is made by solid shaft models, 63mm dimension with Flange Type A and Type D with 9mm and 10mm shaft dimension. Models with and without ZERO PULSE are available together with models Push-Pull or Line Driver output logic. Standard mechanical protection is IP54 but models with IP66 protection are available equipped with special bearings.

MDI63A/D series provides:

- Standard 1,5 m radial cable exit versions. Longer cable models are available on demand.
- 7-poles Type M Amphenol MS3102-E-16-S (for Push-Pull models) or 10-polse M Amphenol MS3102-E-18-1 (for Line Driver models) RADIAL or AXIAL MILITARY (MIL) Connector.
- 5-poles (for Push-Pull models) or 8-poles (for Line Driver models) RADIAL or AXIAL standard M12 connector;

MDI38F/G Series

MDI38F/G series is made by hollow shaft models, 38mm dimension with Flange Type F and Type G with 6mm, 8mm and 10mm hole dimension. Models with and without ZERO PULSE are available together with models Push-Pull or Line Driver output logic. Standard mechanical protection is IP54 but models with IP66 protection are available equipped with special bearings

MDI38F/G series provides standard 0,5 m radial cable exit versions. Longer cable models are available on demand. 7-poles Type M Amphenol MS3102-E-16-S (for Push-Pull models) or 10-polse M Amphenol MS3102-E-18-1 (for Line Driver models) RADIAL MILITARY (MIL) PIG-TAIL Connector are available ON DEMAND. 5-poles (for Push-Pull models) or 8-poles (for Line Driver models) RADIAL standard M12 connector are available ON DEMAND.

MDI58F/G Series

MDI58F/G series is made by hollow shaft models, 58mm dimension with Flange Type F and Type G with 6mm and 10mm hole dimension. Models with and without ZERO PULSE are available together with models Push-Pull or Line Driver output logic. Standard mechanical protection is IP54 but models with IP66 protection are available equipped with special bearings

MDI58F/G series provides:

- Standard 1,5 m radial cable exit versions. Longer cable models are available on demand.

- 7-poles Type M Amphenol MS3102-E-16-S (for Push-Pull models) or 10-polse M Amphenol MS3102-E-18-1 (for Line Driver models) RADIAL or

AXIAL MILITARY (MIL) Connector.
- 5-poles (for Push-Pull models) or 8-poles (for Line Driver models) RADIAL or AXIAL standard M12 connector;

SERIE MDI63F/G

MDI63F/G series is made by hollow shaft models, 63mm dimension with Flange Type F and Type G with 6mm and 10mm hole dimension. Models with and without ZERO PULSE are available together with models Push-Pull or Line Driver output logic. Standard mechanical protection is IP54 but models with IP66 protection are available equipped with special bearings.

MDI63F/G series provides:

- Standard 1,5 m radial cable exit versions. Longer cable models are available on demand.
- 7-poles Type M Amphenol MS3102-E-16-S (for Push-Pull models) or 10-polse M Amphenol MS3102-E-18-1 (for Line Driver models) RADIAL or AXIAL MILITARY (MIL) Connector.
- 5-poles (for Push-Pull models) or 8-poles (for Line Driver models) RADIAL or AXIAL standard M12 connector.

Ease of Use, great functional flexibility but mostly wide and complete applicative coverage are distinctive characteristics of this new Encoder family.

MAIN FEATURES

MECHANICS:

- Solid and Hollow Shaft
- A,B,C,D,F,G Flange Type
- 6,8,9,10 mm Shaft or Hole Dimension
- IP54 or IP66 mechanical protection
- Plastic or Metal housing

ELECTRONICS:

- Line Driver (differential) TTL or Push Pull HTL output logic
- 5/30 Vdc Power Supply
- With or Without ZERO PULSE

RESOLUTION:

- From 100 up to 2500 pulse per revolution

APPLICATIONS/SECTORS

- Logistic/material handling
- Automatic warehouse
- Woodworking Machinery
- Robotics
- Packaging
- Engines
- Agricultural vehicles
- Elevators and lifts
- Biomedical

SPECIAL AND CUSTOM MODELS

The Encóder application scenario is extensive and detailed. In order to meet customer requirements, we are often faced with the need to provide the product with particular mechanical, fixing holes of size and positions related to the mechanics of the machine itself and also the flange and the shaft may vary in size, shape and features. In addition, the electronics, the connectivity and even the pin-out of the electrical signals can be customized in order to minimize the impact of Encóder installation.
M.D. Micro Detectors, thanks to its flexibility and ability to create customized and personalized versions based on the demands and needs of its customers, even on the Encóder family is able to provide special versions that match the best mechanical and electrical characteristics of the machine.
By combining expertise in the various technologies (proximity, photoelectric, ultrasonic, area and safety sensors and now Encóder) M.D. Micro Detectors is recognized as sole supplier for the sensors to be used on your machines. This is not only due to the high quality and technology expressed in our products but also due to aspects like flexibility, speed, quality and above all excellent levels of service, features that cannot be ignored in the complex and demanding market of industrial automation.

RAFFAELE TOMELLI
SALES EXPORT MANAGER FOR ASIA, AMERICA, AFRICA & OCEANIA

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The INC sensor is able to measure any angular position with respect to the gravitational attraction: it is therefore an inclinometer.

The INC sensor results are suitable for all applications where it is necessary to measure and/or detect angular variations (even small ones).

The main features of this sensor are:

- programmable operating range: 360° (or lower)
- reference axis: 1
- angular resolution: 0.025°
- 1 output RS485 (addressable with max 128 nodes)
- 1 analog output (programmable voltage or current)

Micro Detectors

Italian Sensors Technology

INC Series
Inclination Sensor

features

- M18 Housing
- AISI316L Stainless steel Housing
- IP67 Protection Degree

operating voltage	24 Vdc +/- 20%
operative range	360°
resolution	angle 0,025 ● RS485
detection axes	1
frequency range	< 3 ms
technology	MEMS (Micro Electro-Mechanical Systems)
digital output	RS-485 (addressable) 57600 Baud rate - 1 bit stop - parity
MEMS digital resolution	14 bit
analogue output digital resolution	12 bit
voltage analogue output	0..5 V / 0..10 V (programmable)
current analogue output	4..20 mA / 0..20 mA / 0..24 mA (programmable)
temperature range	-25° C...+ 70°C
protection degree	IP 67 (EN60529)
housing material	AISI316L PA12
connections	cable 5 poles / pig Tail M12 5 poles
dimensions	M18
weight	105 g (cable version)

WE ARE CONQUERING THE MARKET FAIR BY FAIR

SPS IPC DRIVES
NUREMBERG
22 - 24 NOVEMBER
2016

SPS IPC DRIVES
PARMA
23 - 25 MAY
2017

SIAF
GUANGZHOU
1 - 3 MARCH
2017

IAS
SHANGHAI
1 - 5 NOVEMBER
2016

IAS
INDUSTRIAL
AUTOMATION
SHOW

Micro Detectors
Italian Sensors Technology

CAPACITIVE SENSORS : CONSTANT EVOLVING

Big news also in the M.D. Micro Detectors capacitive sensors range: the entire series has been revamped to make our sensors even higher performing whilst still being easy to use!

Capacitive sensors are one of the pillars of the M.D. Micro Detectors catalogue and they get an excellent feedback from the market, especially in recent years, since we are experiencing a steady and substantial growth in terms of numbers.

The improvements follow three main directions: the greater ease of use of the sensor is accompanied by further improved technical performance, as well as a unification in a few models of all the typical features of this technology.

All new C18 and C30 sensors completely replace the current range. The enhancements can be summarized below:

Increased EMC immunity

- ESD discharges up to 40 kV
- radiated electromagnetic fields up to 20 V / m
- electrical transient / burst up to 4 KV
- overloading up to 2 KV
- conductive disturbances of up to 20 Vrms
- magnetic fields up to 60 A / m (continuously), 600 A / m (pulse)

Improved mechanical features

- vibration (10 to 150 Hz, 1 mm)
- shocks (2 drops from 1m, 100 falls from 0.5m)
- shock (30 g, 11 ms)
- IP69K protection
- signaling LED moved to the backside of the sensor, for a better visibility during adjustment
- multi turns potentiometer for a more precise adjustment
- same size between shielded and unshielded models
- the same length of threaded part of the current models

Best electronic features

- increased efficiency of the compensation to the presence of dust / moisture for a better reliability
- better stability to variations in the working environment temperature
- possibility to connect up to 3 sensors in series.

The M.D. Micro Detectors capacitive sensors find their application in different sectors:

- Animal feeding- to detect the food level within the feeders;
- The plastics industry- to detect the level of the plastic granules inside the feed hoppers of the extrusion machines;
- Agricultural machinery, earthmoving, lifting machines – typically they are installed within the control joystick and detect the presence of the operator's hand in order to activate the commands only if the operator is in his working station;
- Liquid level control in tanks;
- The wood industry- to detect the presence of panels.

We invite you to contact us so our dedicated staff can introduce and explain to you the new features listed above.

DOWNLOAD THE MINIATURIZED INDUCTIVE SENSOR BROCHURE !!

GIOVANNI DI LORENZO
PRODUCT MANAGER PROXIMITY AND ULTRASONIC SENSORS AND ACCESSORIES

C18 series

M18 cylindrical capacitive sensors

NEW !!!

features

- DC or AC supply voltage
- High noise immunity
- Shielded and unshielded models
- Adjustable sensitivity
- Plastic housing

CE

C30 series

M30 cylindrical capacitive sensors

NEW !!!

features

- DC or AC supply voltage
- High noise immunity
- Shielded and unshielded models
- Adjustable sensitivity
- Metallic or plastic housing

CE cULus

CQ50 series

Proximity sensors
Cubic capacitives

features

- DC supply voltage
- No Adjustable sensitivity
- Flat polycarbonate plastic housing

CE

CQ55 series

Proximity sensors
Cubic capacitives

features

- DC supply voltage
- Adjustable sensitivity
- Flat polycarbonate plastic housing

CE cULus

ULTRASONIC SENSORS : NEW UK1 SENSORS

M.D. Micro Detectors is the only Italian company and one of the few in the world, to design and manufacture ultrasonic sensors, mainly used in industrial automation. In the long history of M.D. Micro Detectors, the ultrasonic technology is the last one we introduced and, at the same time, the one growing more than the others to a market feedback level. In particular, over the last four years, the ultrasonic sensors have become one of the supporting beams enterprise architecture and solid long-term growth plan that we are putting into practice.

M.D. offers a family of high technological and qualitative level, which are accompanied by a fast, flexible and reliable service, both as regards the production and the distribution, and as regards the development of variants of the standard products. In this way we can provide the best application solution, faster than our competitors, to meet customer needs.

The entire production cycle is done internally in a dedicated manufacturing area which during 2015 was revised and enlarged to meet the very significant growth for number of pieces produced and to keep the technological evolution of products themselves.

The technological development of this family has been massively strengthened with the introduction in 2011 of the Lean methodology, which is why, in view of "continuous improvement", M.D. has thought to give something extra to an already advanced product both for application and reliability, making it even more powerful and easy to use.

From this assumption it was born the objective to create some the versions of ultrasonic sensors UK1 series, which will be launched very soon on the market. The new features introduced, compared to current versions, will allow to replace the currently proposed models, providing to our customers a number of important advantages which are reported below:

- Synchronization function, to avoid interferences in all applications where you use multiple sensors;
- A new electronic platform, which will provide to the sensor a biggest stability and immunity to environmental disturbances;
- A working temperature range extended to - 20 ° C ... + 70 ° C;
- Power supply 10 ... 30 Vdc, even

TEAM DEVELOPING ULTRASONIC SENSORS

UK1series

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

features

- 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 4 pin plug exit or cable exit
- Synchronism

IO-Link CE cULus Ex

	UK1A	UK1C	UK1D	UKRIF/E*-*E
				
max. nominal sensing distance	400 mm	900 mm	1,600 mm	2,200 mm
minimum sensing distance	50 mm	100 mm	150 mm	200 mm
beam angle	±8°	±7°	± 8°	± 7°
switching frequency	8 Hz	4 Hz	2 Hz	2 Hz
operating voltage	10...30 Vcc			
max. ripple content	5%			
output type	PNP or NPN NO/NC selectable			
output current	100 mA			
output voltage drop	≤ 2.2 V (@ I = 100mA)			
no-load supply current	≤ 50 mA @ Vdc=24V			
leakage current	≤ 10 µA @ 30V			
power on delay	≤ 300 ms (digital output)			
ambient temperature range	- 20°C...+ 70°C			
temperature drift of Sr	±2%			
short-circuit protection	● (autoreset)			
induction protection	●			
voltage reversal protection	●			
weight	26 g			
LEDs	green (echo), yellow (out 1), yellow (out 2)			
protection degree	IP67			
EMC	IEC60947-5-2			
housing material	plastic housing PBT / AISI316L			
active head material	glass resin			
connection	M12 plug cable exit / PVC cable			
weight	70 g connector / 100 g cable			

for the analog versions;
- Laser marking on all models;
- Same working distance, both for plastic models and for the metal ones
- A new teach-in button, to have a better feeling by pressing it as well as a more simple and immediate use;
- Three LED indicators: green (eco received), Yellow 1 (Output 1 ON), yellow 2 (exit 2 on);
- A new simplified programming menu;
- The Factory Reset function;
- The button lock function, to prevent tampering.

The available models will be:

- Digital single output (NPN or PNP - NO / NC) with synchronization function;
- Analog single output (I or V - positive / negative slope) with synchronization function;
- Mixed Output (1x Digital + 1x Analog) with synchronization function;
- Double digital output (NPN or PNP - Standard / Coded / hysteresis window) with synchronization function;
- Double digital output (NPN or PNP - Standard / Coded / hysteresis window) + 1 x analogue output (I or V) without double synchronization function;

The synchronization function allows to reduce the mutual interference problems between the sensors, where these (up to 10) are installed in a short distance among them. By connecting the synchronization inputs together (pin 5 / grey wire –there is no need to switch off the system, the sensors can be synchronized even if powered up and running), the sensors are forced to issue all in the same time window. Any interference echoes due to reflections, reach, therefore, the sensors out of the correct detection window.

There are special models available, where the sync function is replaced by the multiplexing function. In this case the sensors (up to 4), can be connected by forcing each of them in a different time window. In any position and in any distance the sensors are mounted and with any shape of the object to be detected, mutual interference is eliminated.

The next step in the product development is the introduction of the IO-Link communication, which allows the complete check of all product features.
The M.D. Micro Detectors ultrasonic sensors find their applications in various sectors. Just as explanation, certainly not exhaustive, we may mention:

- Plastics industry detection: level plastic grains within the feed hoppers of the extrusion machines;
- Agricultural machinery, earth moving, lifting machines: distance detection among rows, from ground, control of balancers extension;
- Tanks Liquid level control;
- Wood / glass / metal panels presence detection independent of color, transparency, gloss, etc;
- Machines for waste collection: waste level inside the box, bin presence, operator presence.

M.D. Micro Detectors, always sensitive to market demands, offer a new solution to their customers to have more efficient machines, cutting edge, able to compete with the international competition on all markets.

OUR GLOBAL PCB DIVISION...

... TO GRANT YOU PRODUCTS, QUALITY & SERVICE!

Europe needs reference points. And those who need guarantees in terms of product quality and excellent service, has a SINGLE EUROPEAN CONTACT available: PCB Division of Finmasi Group, synergic union of Cistelaier and Techci.

Finmasi Group PCB Division is composed of following companies:

- Cistelaier S.p.A., in Italy;
- Techci Rhône-Alpes S.A. in Saint Genix sur Guiers, France.

The Misson of PCB Division consists of supporting all different market needs:

- by keeping on investing on new plants, methods and research for the development of its knowledge and know-how;
- by granting its Customers a complete offer in terms of product and service resorting to their European facilities to produce any type of PCB as per European current standards; this is also possible thanks to partnerships established with important Asian producers, in order to satisfy both quality and cost effective needs.

Finmasi Group PCB Division companies stand out for:

- a wide supply range both in terms of product type and for available production capacity;
- a fast prototype design service;
- constant innovation of products, processes and materials used
- an high competence level that allows an efficient assistance of customers during the whole design phase.

Our production plants in Saint Genix sur Guiers, Genova and Modena as well as their R&D departments are the best answer to all those pcb consumers' application needs.

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NEW CR0: EXTENSION OF AREA SENSORS RANGE

After launching the new family of CX area sensors in metal housing, M.D. Micro Detectors have decided to further expand their range of Area Sensors with the introduction of CR0: the new photoelectric array with reflector.

After ultrasonic sensors, M.D. Micro Detectors have therefore developed a new family of products with IO-Link communication system, so as to offer their customers new solutions more and more in line with the paradigm of Industry 4.0.

CR0 series light curtains are optoelectronic devices used for detecting the presence of any object obscuring or reducing the light intensity of light beam, that returns from the reflector .
The housing is made of blue aluminum section 20 x 36 mm; in practice we used the same compact profile as manufactured for CX area sensors. On the top of the sensor sits the teach-in button for the product setting and adjustment. It is made of a transparent material to allow good visibility of the LED indication. The optical window is made of PMMA and the protection degree of the product is IP67 .

In all models of CR0 series there are two LEDs to indicate the various status of the sensor: alignment, optics condition and fault indication. These LEDs are placed in the upper part of the curtain and we have sorted components capable of emitting intense and diffuse light in all directions to ensure excellent visibility in all conditions and in all industrial contexts in which the sensor can be used.

The CR0 photoelectric arrays have an optics composed of a continuous series of lenses with 10 mm pitch for a total height of 69mm; the functions of the individual elements are alternately emission and reception thereby realizing a continuous succession of six pairs of reflex elements, with polarized light emitted and having a wavelength of 617 nm.

The nominal working range is 0.2 ... 5m with reflector RL106G (42 x182mm), but also other reflectors can be used such as, for example, RL105 (40 x 90mm), RL135 (20 x 100mm) and paper RL100D. The minimum detectable object diameter is 6mm.
All models of CR0 series have a button placed at the top of the curtain for the activation of the menu functions: Teach-In and Blanking. There are two ways to Teach: the standard is the Teach G (rough teach), which selects a Margin 2 and the variant is the Teach_F (fine teach), which selects a gain excess of 1.2 times the threshold.

This second adjustment mode can be used only in the case in which the system and the environment allow a large cleaning and mechanical stability. The sensor does not use automatic systems of signal tracking, but its repeatability is based on a sophisticated control of thermal drift. The blanking of rays allows to adapt the height of the active optic window to the specific application, progressively eliminating pairs of beams. The active couples range from a maximum of six to a minimum of one.

The electrical connection is of the pigtail type, consisting of an M12 male connector - four or five poles - with 220 mm cable.
The models of the CR0 family have four interface circuits which can be combined in different ways depending on the model and the number of output cables:

1. Current supply 15...30 V
2. Output IO-Link or SIO (C/Q), PNP/NPN/PUSH-PULL
3. Auxiliaryoutput(Q):PNP/NPN/PUSH-PULL
4. Auxiliary input for selecting commutation impulse LIGHT/DARK or other

You can find as follows some examples of possible applications where the sensors of CR0 family can be used:

- Detection of the front edge, to optimize the distances between

CR0 Series

Retroreflective Area Sensors in compact housing

features

- Parallel beams
- Controlled heights
- Detection distances
- Digital NPN and PNP outputs and IO-Link
- Adjustment by Teach-In
- Blanking function available

IO-Link CE

Power Supply	Operating voltage	15-30 V
Digital outputs	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
Optical features	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°
Environment	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
Dimensions/ Materials	Housing material	20 (front) x 36
	Groove for fixing	2/10/6,5
	Closure screws	2+2
Connectors/ Cables	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

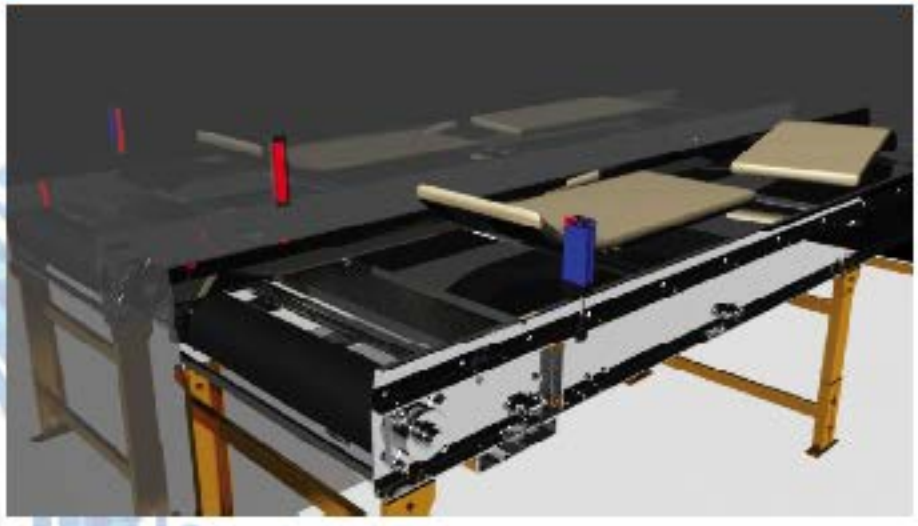
the objects on the separation strips and on the conveyors. (Pic. 3)

- Accurate and reliable detection of the front edge of flat wooden planks, to prevent disruptions of the process. (Pic. 2)
- Reliable detection of products with no jagged edges, to ensure the quality of the process. (Pic. 1)
- Pick-to-Light, to guide the operator to withdraw the material from the right positions.

With CR0 sensors, M.D. Micro Detectors expand their family of Area Sensor, a type of products that were first developed and launched on the market precisely by our company. CR0 is an innovative product that can take on even greater significance in the context of Industries 4.0!

Picture 1

Picture 2



Picture 3

FABRIZIO MARCHI
PRODUCT MANAGER PHOTOELECTRIC AND AREA SENSORS

NEW VIBRATION SENSOR

NEW !!

VBR Series
Vibration Sensor

features

- M18 housing
- AISI316L stainless steel housing
- IP67 protection degree

operating voltage	24 Vdc +/- 20%
operative range	+/- 16 g (MAX)
resolution	15.62 mg ✪ +/- 2 g; 31.25 mg ✪ +/- 4 g; 62.50 mg ✪ +/- 8 g; 125 mg ✪ +/- 16 g
detection axes	3 (X, Y, Z)
frequency range	0...400 Hz
technology	MEMS (Micro Electro-Mechanical Systems)
digital output	RS-485 (addressable) 57600 Baud rate - 1 bit stop - parity
resolution digital output	16 bit ✪ RS-485 (complementary to 2) 12 bit ✪ analogue output
voltage analogue output	0..5 V / 0..10 V (programmable)
current analogue output	4..20 mA / 0..20 mA / 0..24 mA (programmable)
temperature range	-25° C...+ 70°C
protection degree	IP 67 (EN60529)
housing material	AISI316L PA12
connections	cable 5 poles / pig Tail M12 5 poles
dimensions	M18
weight	100 g

Micro Detectors

Italian Sensors Technology

PROXIMITY SENSORS : NEW METAL FACE

Over the past twenty years of our company's history, proximity sensors, together with photocells, represented the largest portion of the annual production of M.D. Micro Detectors.

A long tradition in the design and manufacture of inductive sensors, a constant research for something new. The need to continue with the enlargment of the current range of inductive proximity sensors has lead over the past two years to the launch and completion of the miniaturized proximity range (both in cylindrical format and Cubic). M.D. Micro Detectors is now, therefore, one of the few companies in the world that has developed and manufactures directly this type of product.

In the wake of a great tradition of design and production, M.D. decided to face a new challenge in terms of the development of new products: the metal face inductive sensors, FM line.

The FM line sensors are only the first in a long series of interesting innovations and enhancements that we are introducing to our range of proximity sensors.

In the standard inductive sensors the front part is made of plastic material and the body is in nickel plated brass. These mechanical characteristics, together with the complete resin filling across the whole inductive sensor range enables M.D. to guarantee a high strength in the product which is indispensable when solving most industrial applications.

Then there are applications in which the basic application requirements are robustness, resistance to corrosion, the complete water resistance, wear resistance, durability and reliability: to satisfy the customers also in these conditions, M.D. Micro Detectors has decided to launch a new family of inductive sensors entirely made in stainless steel with laser marking and IP69K protection.

M.D. launches the FM line in M8, M12, M18 and M30 sizes, in order to solve applications in harsh environments, as for example in the food industry where such sensors are able to survive to washing phase with high temperature and high pressure washers lances at high pressure. Or they may find use in metallurgy, being able to survive shock and vibration and having a high mechanical strength even in the active surface.

The switching distances are respectively

VINCENZO GIUDICISSI RESPONSIBLE FOR DEVELOPMENT OF PROXIMITY SENSORS

available models

dimensions	installation	output	distance	NPN-NO	PNP-NO	NPN-NO+NC	PNP-NO+NC
M8	shielded	plug M8	3 mm	FME*/AN-*F	FME*/AP-*F		
				FME*/AN-*F	FME*/AP-*F		
M12		plug M12	5 mm			FMM*/BN-*H	FMM*/BP-*H
						FMM*/BN-*H	FMM*/BP-*H
M18			8 mm			FMK*/BN-*H	FMK*/BP-*H
						FMK*/BN-*H	FMK*/BP-*H
M30			10 mm			FMT*/BN-*H	FMT*/BP-*H
						FMT*/BN-*H	FMT*/BP-*H

FM series

Full metal cylindrical inductive sensors

NEW!!!

- Stainless steel housing
- IP69K head
- M8 Ultra-short body available

technical specifications

	FME	FMM	FMK	FMT
				
nominal sensing distance Sn	3 mm	5 mm	8 mm	10 mm
operating distance	0...1.4 mm	0...4 mm	0...6.4 mm	0...8 mm
hysteresis	1...20%			
standard target	9x9 mm FE 360	15x15 mm FE 360	24x24 mm FE 360	30x30 mm FE 360
repeatibility	5% UB 20-30 V Ta = 23°C ± 5°C			
operating voltage	10...30 Vcc			
max ripple content	NPN or PNP - NO or NC			
output type	≤ 10%			
output current	≤ 200 mA			
output voltage drop	≤ 1.8 V @ 200 mA			
no-load supply current	10 mA			
leakage current	10 µA			
switching frequency	≤250Hz	≤200Hz	≤100Hz	≤80Hz
power on delay	50 ms			
ambient temperature range	-25...+70 °C			
temperature drift of Sr	10%			
short-circuit protection	•			
voltage reversal protection	•			
induction protection	•			
shocks and vibrations	IEC/EN60947-5-2			
LEDs	yellow LED output state			
protection degree	IP69K[1]			
EMC	in conformity with the EMC Directive, according to IEC 60947-5-2			
housing material	stainless steel			
active head material	stainless steel			
connection	plug M8 or M12			

[1] front part of sensor

3, 5, 8, 10 mm for shielded models. There are also available unshielded models with higher operating distances. Below are listed the full specifications of the new product families.

The sensors available are:

- M8 Shielded Conn. M8, up to 3 mm distance, FME* series
- M12 Shielded Conn. M12, up to 5 mm distance, FMM* series
- Shielded Conn M18. M12, up to 8 mm distance, FMK* series
- M30 Shielded Conn. M12, up to 10 mm distance, FMT* series.

Here we would like to report some examples of the potential areas in which the Metal Face sensors M.D. Micro Detectors can be applied:

- applications in which develop corrosive steams (Electrolysis processes);
- applications where metal parts are moved large (along the automotive lines- mounting body lines);
- applications in the forklift trucks (fork) or forklifts trucks lifters;
- applications where parts are tested under high pressure;
- applications needing to count revolutions in hostile environments (on wind turbines with prolonged and continued exposure to all weather conditions);
- application for control Positioning / in high salinity areas (ports ....);
- applications in food processing.

A long tradition in the development and production of inductive sensors, a big knowledge of the various applications where sensors can be allocated based on inductive technology, addressed to the innovation and demand on the market are all elements bringing our company to invest resources in an area up to now never faced.

Thanks to their strength and resistance, the FM families will allow the user to reduce downtime and increase by consequence the machines production and the productivity.

COILS FOR ALL INDUCTIVE SENSORS TYPES

M.D. Micro Detectors is now offering to his partners and valued customers the opportunity to access to the services of M.D. Tianjin for the manufacturing of coils. The main features offered by M.D. Tianjin are:

- a stable manufacturing process, compliant to lean manufacturing principles and M.D. control protocols. Totally controlled by our people;
- quality of raw materials used;
- competence of our operators in China;
- reliability: all the products manufactured are subject to quality and functional tests;
- technology and know-how: more than 40 years of experiences in the design and production of coils for inductive sensors;
- services: fast production and fast delivery worldwide;
- customization: production of coils with diameter and number of windings according to customer's request;
- competitive prices.

We assure to our Customers the utmost level of confidentiality and secrecy. M.D. is well known on the market for his long history of reliability and reputation.
With the development of Coils production, M.D. Micro Detectors is now "SENSORS AND MORE".

Micro Detectors

Italian Sensors Technology

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EXÉ 1985

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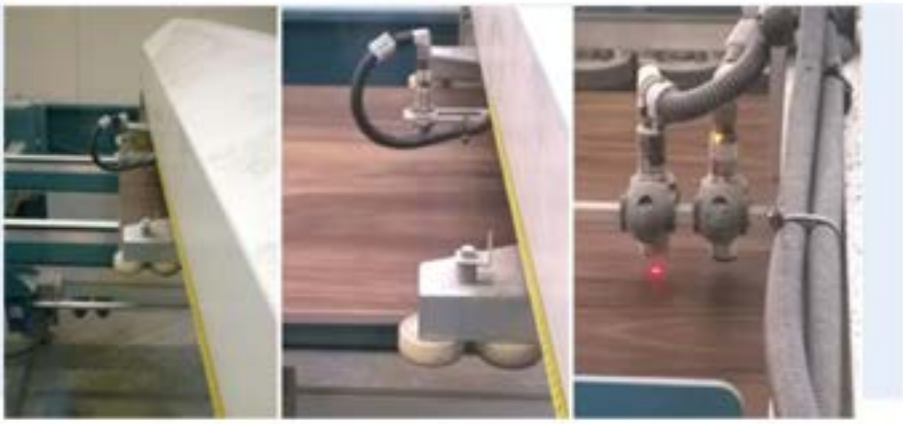
CERAMIC INDUSTRY: FOCUS ON PRODUCTS FOR INDUSTRY OF CERAMIC MACHINERIES

Picture 1



Not everyone knows that M.D. Micro Detectors was born and developed in the tile machinery field. In Italy, not far from Modena and precisely in the Sassuolo district, starting in the early 50's was born and has developed one of the first ceramics industrial districts. The district of Sassuolo for years was the first in the world for number of square meters produced on yearly basis. In this district and in neighboring areas it has grown an induced area of ceramic machinery manufacturers, which still constitutes excellence and a worldwide benchmark.

The story is that in the early 1970's, M.D. (Which at the time was still called Diell) made the first photoelectric sensor for the ceramic machinery, which at the time used only mechanical sensors. M.D. Micro Detectors realized the first photoelectric sensor (the famous LS1), proposing a new revolutionary housing M18 cylindrical shape, today recognized worldwide a standard shape but which, for the first time in the world, was introduced to the market just by our Company.

THE FIRST M18 PHOTOELECTRIC SENSOR IN THE WORLD!!!

The ceramic industry, as well as spreading in many parts of the world different from those where it was originally developed, has evolved a lot both from the technological point of view and from that of the materials and shapes used. A few decades ago, building tiles and sanitary was not a particularly complicated field, where the raw material used was mainly poor. Now the technology has evolved so much, as well as the worldwide competition. This is also evident in the field of machines and ceramic production lines. The great evolution recorded in this area means that the role of producers of machine components is increasingly important to ensure the best technological performance and to ensure the full efficiency, durability and consistent performance by automatic machines .

The Catalogue of M.D. Micro Detectors has many products ideally suited to achieve the targets above. Many of them have been specifically developed to meet the application requirements of these types of machines. Moreover MD, is strong both in their great technological heritage matured with decades

Picture 2

of experience in this area and of their current organizational structure. We are able to develop in a short time application solutions tailor-made based on the needs of machine manufacturers and of their production lines.

Strong in the deep technical background of this field, we illustrate in this article the main application areas where M.D. Micro Detectors excels as a partner of total reliability for their customers. Specifically we will deeper analyze the following aspects:

- Handling
- Detection
- Safety and security
- Other application solutions.

HANDLING

To move rationally and efficiently the products is one of the key factors for the time and cost reduction. To detect accurately and reliably the presence of a product, M.D. offers a complete range of sensors in M12 cylindrical body (Series DM), M18 (SS / FA series) and rectangular miniaturized housing (QM series):

- The background suppression models with fixed (SS0, range 50 mm; SS1, capacity 100 mm) and adjustable displacement (FARS, range 30 ... 130 mm) allow to detect different objects with a low interference of the colour differences or presence of backgrounds
- The direct diffusion models are lower cost and easier solutions to install for ceramic tiles detection
- Reflective and polarized emitter and receiver barriers.

In some critical applications, such as the drier exits, the standard photocells may have problems due to the high temperature of the tile surface. As a solution, M.D. offer the special photocell FAI2_5I, with optics able to resist higher temperatures of up to 110 ° C.

DETECTION

To detect the presence of a tile in a precise and reliable way in all working conditions high-quality products are required and it is for this reason that M.D. propose:

- Laser photocell (Background suppression, diffuse, polarized and thru beam) with very high working frequency, up to 10kHz for the thru beam models and up to 1.5kHz for the BGS models. These products allow to precisely detect the position of the tile and they can be used for the synchronization of screen printing machines
- Ultrasonic sensors in all applications where the presence of dust is very high and it is necessary to provide some air nozzles for cleaning. Due to the mechanical complexity to bring the air in several positions together with the difficulty of arranging an appropriate cleaning of the reflectors (difficult in high environmental humidity conditions), M.D. offer a simple, convenient and reliable solution thanks to their range of ultrasonic sensors (UK6 / UK1 series).

PROTECTION AND SECURITY

M.D. offer solutions for operators protection:

- Optical beam in Category 2 (LS2 series) and in category 4 (LS4 series) with up to 14 mm detection. Where the muting function is required, it is available the relay module SB400M with 2 muting inputs
- Single beam M18 sensors (SH series) or M30 (TH series) with external control unit SBCR03, available with muting function, to protect perimeter for the access of large areas, such as the load zone of palletizers.

OTHER SOLUTIONS

In addition to standard sensors mentioned above, M.D. offer other products which, in their long experience in such a field, have been effective:

- Area sensors (BX10 series) → these sensors can be used on automatic vehicles to ensure that the pallet is loaded correctly. Thanks to the optical crossed beams can prevent any irregularity and pallet breakage;
- Vibration sensors (series VBR) → to monitor over the time the machine status and avoid sudden stops caused by breakdowns and costly downtime, and especially to avoid any wrong usage;
- Capacitive sensors (C18 / C30 series) → to detect the level of material inside the hoppers or tanks;
- Luminescence sensors (LDLV series) → easy to use and cheap solution for sorting lines, to identify the 1st and 2nd choice tiles;
- Inductive sensors → to detect, thanks to the presence of a cam, the position of a mechanical movement, the number of an engine revolutions.

Also, as previously stated, our company contains the high specific technological know-how gained in this industry, with an innate propensity and an incredible speed and flexibility to modify the standard products in order to solve specific application needs coming from machine manufacturers.

Typical examples of customization are:

- Cable models with different cable lengths;
- models with dedicated labels;
- Cable models with dedicated connectors / custom;
- models with different performances from those listed in the catalog (for example, detection distance, operating frequency, etc ...)

Our availability for customization has frequently led us to the creation of real new products, where there are some really needed prerequisites.

Technology, Quality, Service and ability to get custom products in short time, are the Genetic codes imprinted in the DNA of M.D products.

We are ready to be tested by those who still do not know us!

DM series

M12 cylindrical photoelectric sensors

features

- Models diffuse reflection, polarized and through-beam
- Local and remote teach-in function
- Light-on / Dark-on selectable outputs
- IP67 protection degree
- Multifunction LED status indicator
- Complete protection against electrical damages
- Approvals: CE and cULus listed

SS - SP series

M18 DC with lateral adjustment

features

- Models with side sens. adjustment on axial and right angle optic
- LO/DO selectable output
- ATEX models, cat. 3, available on request
- LED status indicator for all versions
- Complete protection against electrical damages
- Approvals: CE and cULus listed

FARS series

M18 direct diffuse with adjustable background suppression

features

- 30...130 mm adjustable max reading distance
- Cable or M12 plastic plug versions
- Supply voltage 10...30 Vdc, output current 100 mA
- LED light status indicator
- IP67 protection degree
- Complete protection against electrical damages
- ATEX models, cat.3, available on request
- Approvals: CE and cULus Listed

FA series

M18 photoelectric sensors DC

features

- Complete range of M18 sensors with 10...30 Vdc power supply
- Axial and radial optic with flat surface
- Retro-reflective models for transparent objects detection, with red emission
- IP67 protection degree
- Metallic or plastic housing
- Sensitivity adjustment available for all models
- Total protection against any type of electric damages
- Approvals: CE and cULus listed

FAL BGS series

M18 LASER with adjustable background suppression

features

- M18 Photoelectric sensor Background Suppression with Laser emission
- Models in Class I and Class II Laser emission power
- Axial and Right angle optic materials
- Sensing distance adjustment by trimmer
- Collimated Light spot
- Complete protection against electrical damages
- Nichel brass housing

UK6 and UKR6 series

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

features

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

IO-Link

VBR series
Vibrations and inclination sensor

features

- M18 housing
- AISI316L stainless steel housing (front included)
- IP67 protection degree

LDLV series
Special photoelectric sensors
M30 luminescence scanner - DC

features

- Ultraviolet light emission
- Local and remote Teach-in function
- Multifunction LED status indicator
- LO/DO selectable outputs
- Delay off selectable
- Complete protection against electrical damages
- IP65 protection degree

BX04 and BX10 series
Medium resolution area sensors

features

- IP67 protection degree (IP69K special model)
- Complete protection against electrical damages
- Detection of objects with irregular shape
- ATEX models, cat. 2 and cat. 3, available on request
- LED indicators
- Crossed beams detection

SBCR03 series
Control unit
Type 2

features

- Up to 6 sets of safety photocells M18 (SH4-IA) or M30 (TH6-IA) interconnectable
- DIN RAIL Mounting
- Body protection and access control
- Cat. 2 according to EN 61496-1
- Cat. 2 / PL c according to EN ISO 13849-1; SIL CL 1 acording to EN 62061 / IEC 61508
- Models with single/double channel Muting and Override functions
- Response time less than 5 ms
- 2 OSSD outputs

SH-IA/IC and TH-IA/IC series
Photocells
Type 2 and Type 4

features

- M18 Models 10 m (axial optic) and 5 m (radial optic) operating distance
- M30 models 60 m operating distance
- EN50100 Category 2 and Category 4 compliant
- LED indicators
- Plastic and Metal Housing
- Inputs and Outputs IEC61131-2 compliant and adaptable with any safety module
- To be used together with a Category 2 or Category 4 safety control unit to obtain a safety system EN ISO 13849 compliant

Serie LS2, LS2_K, LS2_H, LS4, LS4_K, LS4_H
Type 2 and 4 light curtains

features

- Compact housing (28 x 30 mm) and no dead zone on cap side
- Resolution 30, 40, 50, 90 mm for hand protection and presence control and 2, 3, 4 beams for body protection/access control (LS2, LS2_K, LS2_H)
- Resolution 14 mm for finger protection, 20, 30 , 40 mm for hand protection, 50, 90 mm for presence control and 2, 3, 4 beams for body protection/ access control (LS4, LS4_K, LS4_H)
- Controlled distance up to: 3, 4.10, 12 m and up to 20 m (LONG RANGE)
- Base, Standard versions and Master, Slave version to connect up to 3 sets in cascade configuration
- Selectable Automatic/Manual Restart and EDM integrated functions (Standard models)
- Selectable controlled distance
- IP69K protection models (LS2_K and LS4_K) and models with integrated heating system to reach -25°C operating temperature (LS2_H and LS4_H)
- Standard M12 da 5 and 8 poles connectors

WASTE INDUSTRY: FOCUS ON PRODUCTS FOR WASTE RE-CYCLING INDUSTRY

One of the M.D. key focus has been, in recent years, to be concentrated on the actual market needs and customer feedback. Do not follow "just" the latest trends, but try to identify new areas in which to make an effective and useful support. Do not stop to their source, but to look for new areas where experiencing and providing solutions. When a product development starts, in fact, we check first what the market really needs from that specific technology, and then we analyze in a more detailed way the possibility to use the same product to solve different application areas.

Among the different new areas approached in recent years and to which we have already referred to various M.D. News numbers, there is the "waste collection and treatment", for which you find below some suggestions coming from our application experience.

The waste collection and treatment is a strategic industry, whose importance is growing, together with its technological evolution. It is a highly critical area from different point of view, social, environmental and economical. Day by day you can see smart bins numbers increasing, and they provide information referred to their level of coverage, and therefore they "require" only to be emptied when they are actually full. In this way, companies can plan the collection vehicles route in a much more efficient way, with consequent savings of personnel costs, maintenance vehicles, fuel consumption and, consequently, less pollution.

M.D. are involved with their customers in seeking solutions which can provide information about the fill levels of bins for waste collection.

First we started from an analysis of working conditions:

- Environment presence of dust, liquids, condensation, ...;
- Type of objects to be detected- it is to detect any kind of rubbish and therefore different materials, more or less solid, more or less compact;
- Positioning of the sensor- to facilitate the installation it is necessary to use a small-sized sensor. In addition, the sensor has to be easily replaced in case of damage which can be caused by unskilled personnel.

Under these operating conditions, M.D. Micro Detectors consider that an effective solution is represented by the use of an ultrasonic sensor.

Initially we used a standard ultrasonic sensor with direct diffused detection. The operation, however, presented some problems: the presence of a dead zone close to the sensor, detection problems in the case of objects positioned angled to the axis of the sensor (the ultrasonic beam was deflected and not received by the sensor, for this reason the object isn't always detected).

To overcome these critical applications we have developed a new ultrasonic sensor technology: the retro-reflective. Such sensors require the presence of a fixed background perpendicular to the axis of the sensor. The sensor detects the distance from that background.

The presence of any object between the sensor and the background is then detected correctly, irrespective of its position (the dead zone is virtually cancelled) as is its orientation.

The new ultrasonic sensors UKR (in M18 body) and UTR (in M30 body) are then installed on the side of the box, acquire as background the opposite wall of the container (through the push button), and provide a "signal too full" when the bin is full.

In addition to the solutions for waste collection in underground containers, M.D. also provide solutions for waste compaction, for both container presses and stationary presses.

In these applications it is necessary to use a sensor which prevents the vehicle activating the compaction whilst the container is being emptied as it bumps against the compactor itself. For this application M.D. propose the dual digital threshold ultrasonic sensors: the first switching point provides a signal indicating that the driver is getting close to needing to compact (and which, therefore, must slow down): the second indicates the point where it must stop. The ultrasonic UK1F / EW sensors (in M18 body) and UT1B / EW (in M30 body) allow the easy adjustment of the switching points and they are easy to install.

Picture 1

Picture 2

Always related to the collection of waste, M.D. provide solutions for sales and canteens points.

A photoelectric sensor FAI series (M18) or QMI (in cubic body) placed in front of the compactor opens the emptying door when the user is approaching. When the rejection level reaches a certain level, selected by a photoelectric sensor or an ultrasonic sensor, it begins the phase of compaction to reduce the waste volume.

In addition to standard products, M.D. offer customization of their products dedicated to the customer or an individual application, from the simple (cable lengths or dedicated connectors, bodies of non-standard dimensions, customized labels with

Picture 3

customer's logo) to the more complex, where we can realize a completely new product.

Our company is at your complete disposal to explain in detail our experiences and our applications.

FA series

M18 photoelectric sensors DC

features

- Complete range of M18 sensors with 10...30 Vdc power supply
- Axial and radial optic with flat surface
- Retro-reflective models for transparent objects detection, with red emission
- IP67 protection degree
- Metallic or plastic housing
- Sensitivity adjustment available for all models
- Total protection against any type of electric damages
- Approvals: CE and cULus listed

QM series

Miniaturized photoelectric sensors with high performance

features

- Cubic miniaturized photoelectric high-performance sensors with long sensing distance
- 2 kHz switching frequency, background suppression with mechanical adjustment
- Wide range of models: diffuse reflection with short, medium and long sensing
- distance, polarized, reflective for transparent objects, through-beam and background suppression
- Available with cable and M8 plug exit or with M8-M12 pig-tail
- Selectable LO/DO output state
- Completely filled with resin (except background suppression models)
- Complete protection against electrical damages

UT and UTR series

M30 cylindrical direct diffuse & retro-reflec
Ultrasonic Sensor with Teach-In button

features

- M30 ultrasonic sensor with standard housing and with large front with high performances and high sensing distances
- Adjustable hysteresis function: models with double digital programmable output specific for level detection
- 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
- Two multifunction LEDs: orange LED for adjustment procedure and output type and green LED for target alignment

CHINA ON THE LINE: JESSICA GALANTUCCI AND GARY LI SPEAKING

M.D. Micro Detectors (Tianjin) Co., Ltd was establish in 2012. Starting from that date a new chapter in the long history of M.D. Micro Detectors begins. About 75% of the turnover of M.D. Group is made abroad and the incidence of the sales in China is becoming more and more important.

The series of the interviews to M.D. persons in this number continues giving voice to two of the most relevant professionals who are part of the Managing Team of M.D. Group: Jessica Galantucci (Sales Manager Brand Label Customers and Subsidiaries) and Gary Li (Responsible for the Chinese company). These two outstanding professionals together with their teams working in China and in Italy are fully supported by the entire organization in the Parent Company, are continuing to grow market share in the biggest industrial markets in the world.

GARY AND JESSICA, PLEASE PRESENT YOURSELVES!

Gary: I was born in Beijing in 1971. I graduated from Tianjin University, which is quite outstanding and well-known for its science and engineering professionalism and I majored in Mechanical Engineering. I was born in a family of intellectuals: both my parents have been engaged their whole life in the research of Agriculture. I am married and my wife is a financial manager. I have a daughter who is 18 years old and studying at high school.

Jessica: I'm 35 and I'm from Puglia but from Modena adopted (I've lived here for 17 years). My schooling is totally humanistic. I took my degree in a Language High School and I graduated in Foreign Languages and Literature at the Bologna University. Talking about my personality, who knows me usually sees me as restless, very stubborn and highly motivated. In a few words, I always need new challenges, to constantly reach new goals never giving up, constantly motivated by a strong passion. M.D. is for such a reason the only reality where I can feel comfortable.

SUMMARIZE TO OUR READERS YOUR PROFESSIONAL HISTORY!

Gary: After I graduated from Tianjin University, obtaining the degree of Mechanical Engineering in 1994, I got my first offer from Motorola where I worked for 12 years. In that company my responsibility was the management for engineering technologies and production. In 2006, I started to work in the Honeywell corporation where I was in charge of techniques and operations, etc. After 5 years working for Honeywell, I joined M.D. Micro Detectors.

Jessica: When I finished University, I immediately started working as an area manager in the automotive sector. For almost six years, I was greatly intrigued by the sales management especially worldwide and I gained experience in most sales channels and with many types of partner so I realized it was really my job. But, fortunately, for limited space and no long-term vision in my previous experience, I began to approach M.D..

WHEN AND WHY DID YOU JOIN M.D. MICRO DETECTORS?

Gary: I officially joined M.D. in June 2011. I was the very first employee of this company in China. M.D. China was a brand-new entity, it was quite challenging as I was fresh and I knew the road in front of me would be full of twists and turns. When I met our President, Mr. Masi, for the first time, the way he made me feel, his strong confidence and enthusiasms had extremely influenced me and attracted me. He opened the M.D. door to me and he gave me the feeling and trust of a bright future... I think that is the main reason I join M.D. in the first place.

Jessica: I really courted for three years this company: I really wanted to become part of the M.D. Micro Detectors team. This company was always described to me as a growing, dynamic, made of passionate people who work responsibly and above all as a unique team. During the different job interviews I breathed personally this enthusiasm and the will to do. For this reason I had to get in to M.D.. And so it was in October 2010.

DESCRIBE YOUR CURRENT POSITION AND RESPONSIBILITIES IN M.D. MICRO DETECTORS.

Gary: I have the responsibility of managing the operations and the personnel of M.D. China from every point of view: sales, manufacturing, accounting and finance, compliance with Chinese Laws and Policies. In doing this job I am fully supported by the Parent Company.

Jessica: Actually I am responsible for Brand Label Customers Sales, and for sales development of the Spanish and Chinese Subsidiaries.

CAN YOU PRESENT MICRO DETECTORS CHINA?

Gary: M.D. China is located in Tianjin, one of the biggest cities in North China. Our site is located in a very industrialized and comfortable area, the XEDA. At the moment we are a company with a few number of employees (twelve), big spaces to use, many ideas and projects to realize. We are in the most industrialized country of the world and we want to be an integrated and developing company in this unbelievable country.

Jessica: M.D. China is for me a small-big reality. Small in terms of number if compared to the big players in this market, but with a huge potential, both for the people who are part of it and for the types of applications we face every day.

PRESENT THE STRATEGY AND THE TARGETS OF M.D. GROUP IN CHINA

Gary: our initial target was to find a place to launch an "anchor point", set up an effective and professional organizational framework and scheme for the further development. Our current strategy is to develop

this company both from the sales and the manufacturing point of view and to introduce on the Chinese market the brand "M.D. Micro Detectors". We are taking a step-by-step approach, putting huge efforts in developing solid and long lasting relationships.

Jessica: In China, our goal is to continue to grow in terms of sales volumes and visibility on the automation market and more. Establish our reality day by day in a world where the competition is very fierce, both by the presence of all the big players and the growing presence of many local producers. The goal is also to establish ourselves in China not only following the market trend but gaining the trust of customers through our products, service, professionalism and our enthusiasm in working together whilst always looking to the future.

Can you present the Chinese Team and the Italian Team supporting the development of the Chinese Market?

Gary: M.D. China has 12 personnel. I'm actually charges to manage the subsidiary and I am engaged also in the sales development together with our salesman Bowen. In our team there are also other 2 people working in the accounting, finance and logistics, Cristina e Linda. Zhang (more involved in the technical issue) works as support in the coils manufacturing business. All the other 7 people are operators working for coils production. Regarding our Chinese Team, we need every staff member here to work as an "all-rounder", that means you must try your best to learn and fit in all kinds of jobs that you have been assigned to and having many types of ability. As for the Italian headquarters, they've given us their huge support in developing the Chinese Market, including the qualified products, the excellent technologies, the skilled staff and the big financial supports, in so many ways. Especially, what makes us quite impressed and touched is that, many Italian colleagues take their time off to assist the Chinese Team after finishing their own jobs.

Jessica: We are developing the sales force of M.D. in China under the leadership of our Branch Responsible, Gary. Some potential customers are also identified by the parent company which is directly and daily involved in all projects for a greater efficiency and success. Usually, in fact the applications are analyzed by our product managers to identify immediately the best solution. Our colleagues and Chinese customers are supported by a team at the Italian Parent Company, composed of myself, Maria Luisa Montanari who is in charge of customer care activities and Hilson Law, a professional whose origins and nationality are Chinese, has been part of our team since the beginning of this year. As regards marketing activities, the support for the Chinese branch is provided by the Marketing Communications Group Service.

Which are the main targets for Micro Detectors China for the next five years?

Gary: Our primary targets are very easy: to expand and spread our brand name and then increase the sales value.

Jessica: The target for the next five years is to grow and strengthen, every single month, sales and to always be looking for new customers with whom to establish long lasting relationships. Conquering, step by step, new markets, we intend to expand our business to give more support to our customers. Moreover among our objectives, we are currently in the evaluation phase to serve the local market with a local production.

The Managing Team for the development in China is composed by an Italian woman graduated in foreign languages and a Chinese man graduated in Mechanical Engineering. This mix could sound curious...

Gary: Yes, it is indeed curious and weird but still wonderful: Women & Men, Italians & Chinese, Literature vs Technology, Western civilization vs Oriental culture. We don't even have the same working time, however, what we really share is the mutual strategic visions and same core values, which make us work as a real team. We collaborate with each other, we have differences but we complement each other and we both work really hard. I strongly believe, with the remarkable assistance and synergy from Jessica and other Italian colleagues, M.D. China will achieve all its goals.

Jessica: Thanks to the results, I am convinced that this is the best combination. From my point of view, any proposal or idea in China needs to be structured and Gary with his planning is a perfect and tireless organizer. He started as Operations Manager, he had to work a lot on his personality to work for the first time in sales. The amazing thing is that following our enthusiasm and using his engineering skills he has been really successful in achieving his targets. The discussions between us are sometimes entertaining and sometimes lively, but what is really exciting for me is to see a person absolutely methodical and precise, used to manage a factory, who can easily manage also business ventures and take pleasure in seeing them realized. It is the thing that makes me feel proud. As our President Marcello Masi says "production is an alchemy, selling is a magic"!

Why choosing M.D. Products?

Gary: taking into account the feedback of our current clients, the main advantages of M.D products are considered:

1. Made in Europe

JESSICA GALANTUCCI
BRAND LABEL AND SUBSIDIARIES MANAGER

which guarantees to the customers excellent quality and reliable performances;
2. Some "unique" features offered, for example, by our Ultrasonic Sensors;
3. We offer the specialized sensors that could be applied in the extremely harsh environments;
4. We offer an effective and timely service;
5. The clients are also very satisfied with our Customized Services.

Jessica: The M.D. products for me are essentially "solutions" and the result of sharing and passion at various levels. Seeing the growth in a product family through the eyes of the ones who develop them and who produce them, is a priceless satisfaction. Most importantly I like hearing that our customers are happy and satisfied by what we have supplied them with. And I often realize the enormous luck I have in my role, being able to hear and see all this.

What is for you the M.D. Style?

Gary: M.D. Style is enjoying the work with lots of passions and positivity. To face the challenges with great encouragement and confidence.

Jessica: the M.D. style for me it is to work hard but having fun, knowing to count on a real Team. There is no problem that can't be solved and there is no success or defeat that is not shared. Each one of us considers this company as our own property, and for this reason we work every day to make it even better. Honestly I find that it was really a genius the person transmitting to all of us, from the beginning, this sense of belonging. All thanks to our CEO, Giacomo Villano, who with all his humility has perfectly managed to achieve this powerful human and professional project, and to our President, Marcello Masi, who allows us to act with wide powers with the only condition to bring results.

Can you make a short summary of your experience in M.D.?

Gary: my previous career experiences were focused on the technologies and operations. Since I joined M.D., I started to enlarge my professional background, undertaking the task in marketing and sales. This was a new and arduous experience. I am facing a big and very interesting challenge. Whenever there is a project fails, honestly, I feel so frustrated and upset but I tell myself to be calm down and to always be confident in front of other staffs, because I believe: Not all the efforts will result in success, but giving up will result in failure.

Jessica: M.D. for me was and is the most important school of life that ever happened to me. When I joined in 2010 I was given the responsibility of all the brand label customers. Surely a great responsibility to which in following years were added those of the Chinese and Spanish subsidiaries. Let me say, also in this case, two words for the last mentioned reality, for which we all are proud of and which I personally deem "a real gem", especially for people who work there, as first the General Manager, Daniel Jornet.

Which are the main characteristics to have to compete in the Chinese market context?

Gary: First of all, I believe the more "uniqueness" performances held in our products. Secondly the service we are able to provide to our customers from every point of view. The typical M.D. customer approaches us, because he is absolutely sure to find a solution not only through the sensors, but for everything is around, that is to say service, support and speed. All our customers trust us and they know perfectly they are an important part of the project they ask us to follow. Every single activity, related to the project, aim to follow their needs.

Jessica: Quality, support and understanding of all the needs coming from customers. To be always on their side having the right products and providing assistance for all product which match perfectly their application.

What do you like best in your job?

Gary: Since I was the first employee to M.D. China, you can imagine when the company first set up, how many difficulties we had to face. But due to these difficulties I am so proud of the things we have realized and, even more important, I am very excited and committed to realize the thousands of things we have to do in the future.

Jessica: Look for new goals, share them with my colleagues and with our customers, create something really useful and see the satisfaction of those who is create them and the ones using them. Never stop upon reaching a target but continue to look forward and think about the next challenge.

What do you like best in M.D. Micro Detectors?

Gary: Compared to all my professional activities, what I like best in M.D. is that whether it is M.D. Italy or M.D. China, the reaction speed is very fast and it has a stable staff structure, which ensures a sound collaboration between both sides.

Jessica: The people and the enthusiasm you can breathe all the days and in any situation. Knowing that you can face anything relying on the team to which you belong. To be in measure to communicate with all departments and share as much as possible with them, always creating new business possibilities. The dynamism and seeing these realized day after day. The long-term strategy and objectives are very clear.

GARY LI
M.D. MICRO DETECTORS TIANJIN RESPONSIBLE

WHICH ARE THE MAIN POINTS OF STRENGTH OF M.D.?

Gary: I consider M.D. is a very effective technology-based enterprise. With a full-heart of ambitions, lead by Mr. Masi and Mr. Villano, M.D. has achieved excellent performances and financial targets, but M.D. has never and will never ever stop, we keep working to optimize our business in all aspects, so that it lays out a solid foundation for the future.

Jessica: reliability and speed of response, in production and in providing customer service. Constant and direct customer support, versatility of products, total availability and responsiveness in implementing customizations. A cohesive and prepared team.

WHICH IS YOUR OPINION ABOUT THE POSSIBLE FUTURE DEVELOPMENTS OF SENSORS TECHNOLOGY?

Gary: I use three concepts:

- Intellectualization: to increase the features of communications functions, so as to realize the automatic production information management and to become part of the cores in INDUSTRY 4.0;
- Diversification: to enrich the production lines, increase the cubic proximity sensors, magnetic switches, cubic ultrasonic sensors, laser range detection sensors, laser scanners, etc.
- Characterization: Enhance the R&D on the sensors used in special harsh environment, ex. anti-corrosion types, ultra-temperature and ultra-low temperature conditions, and as well compliant to IP68 and IP69K, etc.

Jessica: The world of sensors is becoming more and more technologically advanced. The goal is to simplify to the customers the choice and installation. If we think about all what is going around the topic Industry 4.0 and I/O link we become fully aware of the opportunities for simplification of use which are submitted to our customers. The interchangeability of technology or between a brand and another is a real revolution, to which all end users will greatly benefit. To make possible such an option, all manufacturers must bring their own sensors to a "superior" level. And that's why M.D. chose to start with the most advanced technology, the ultrasonic one, that best lends itself to such a "revolution".

WHICH IS YOUR OPINION ABOUT THE POSSIBLE FUTURE DEVELOPMENTS IN ELECTRONIC INDUSTRY?

Gary: I cite other three key words:

- Systematization: from the supply of the single product change, to the offer of the complete solution;
- High-Performance: Upgrade of the stability of the products; reduction of the failure rate, in order to meet the higher requirements of the clients;
- Customization and Flexible manufacturing: Along with the highly reduction of the entry barriers in the electronics industry, more customized solutions will be inquired. The flexibility in manufacturing with rapid reactions will be in demand.

Jessica: the continuous developments in the electronic world offer more possibilities to the companies that develop electronic products. Miniaturization of components, more and more powerful and versatile microcontrollers, ultra low-power systems are just some of the enabling means for the development of increasingly complex products in terms of functionality, but simple to use.
The sensor world is and will increasingly be a fundamental part of an already evolved industrial process because through the unremitting developments in the electronics world and also in the integration of connectivity systems also in "simple" products, it will be increasingly diffused the sensors usage to control and to monitor industrial processes with the ultimate goal of bringing our industries to the achievement of the industry 4.0 paradigm.

WHAT DO YOU SUGGEST TO A YOUNG BOY OR GIRL APPROACHING WORK FOR THE FIRST TIME?

Gary: As a new comer, first of all you need to be a fast-learner with desire, so that you could combine what you have learned from school to the real needs and situations, and to fit in the new role as soon as possible. In addition, you need to learn how to work with others, that is the foundation for creating a sound working environment and to work effectively.

Jessica: My suggestion is to start any work experience with great passion and rigor, feeling it and building it on the basis of our own personal characteristics, in order to become a way to realize themselves as men and women. Always to be hungry for knowledge and listen to others around you and to all possible interlocutors. To be patient in learning every day, and to never have the presumption to feel "aware" of all. Always to count on a team and share as much as possible.

WHAT DO YOU SUGGEST A YOUNG BOY OR GIRL APPROACHING FOR THE FIRST TIME THE SENSORS' INDUSTRY?

Gary: There are so many types in the sensors world and all kinds of applications, so I think to approach to this industry, you need to learn on the products' knowledge and to be familiar with them as soon as you could and, if possible, to be on site of the applications and learn from the real practice is a plus. Meanwhile, most sensors products needed to be on trial in field that requires a certain ability of experimental analysis.

Jessica: Looking at my experience and what I could understand up to now (despite my educational background, not at all connected to the world of electronics) I can safely say that behind the sensors there is a huge world made of various facets. Up to now I could not identify, even with my little experience, a more "creative" field than the industrial sensors one, at all levels. From the design to the production, passing by all the applications of the same sensor, also a restless person like me, can really "have fun." The dynamism tied to this world is so addictive, to make "recreating" my job all days.

IF THE SKY IS YOUR LIMIT, JOIN US!

We don't look for dreamers, we look for people who believe it's possible to realize their dreams in the only way we know: with the passion, professionalism, a forehead of sweat and the team working.
If the electronics and the Industrial Automation worlds are your professional ambition then come and join M.D. Micro Detectors. We are waiting for you!

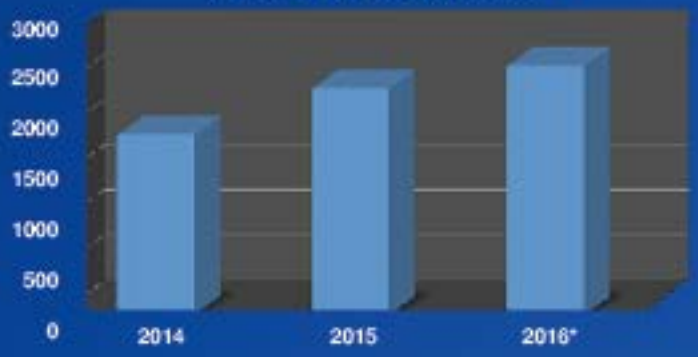
Send your curriculum vitae at:
info@microdetectors.com.

TRAINEE PROGRAM

INTERNSHIP OPPORTUNITY FOR STUDENTS

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

HOURS OF INTERNSHIP



INSTITUTES

AREAS OF EXPERTISE

*data updated at 31/07/2016

INTERNS

Surname Name	Specialization	Area	School
Andreoli Roberto	Electronics	R&D and Production	ITIS Fermi
Mazzoli Davide	Electronics	R&D and Production	ITIS Fermi
Venturi Luca	Computer science	Information Technology	ITIS Corni
Circiello Marielena		Marketing	ZENIT
Oursana Ishac	Electronics	R&D and Production	ITIS Fermi
Taddei Filippo	Electronics	R&D and Production	ITIS Fermi
Faggion Francesco	Electronics	R&D and Production	ITIS Da Vinci
Koukpaki V.J. Mary	Electronics	R&D and Production	ITIS Da Vinci
Amal Youssef	Electronics	R&D and Production	ITIS Da Vinci
Morini Marcello	Electronics	R&D and Production	ITIS Da Vinci
Di Francesco Antonio	Electronics	R&D and Production	ITIS Corni
Kudlicki Bartolomiej	Electronics	R&D and Production	ITIS Corni
Sarcinelli Davide	Mechanics	R&D and Production	ITIS Corni
Poppi Tobia	Electronics	R&D and Production	ITIS Fermi
Vaccari Luca		Logistics	ZENIT
Zini Leonardo	Electronics	R&D and Production	ITIS Fermi

WORKSHOP AT SCHOOL

Surname Name	Subject	School	Duration
Trivigno Rocco	Biomedical	ITS Mirandola	28/01/2016
Bosani Roberto	General presentation of MD	ITIS Fermi	01/04/2016
Mauro Del Monte	Analog electronics in sensors field	ITIS Fermi	15/04/2016
Mesoni Marco	Applications of sensors in industrial automation + visit in MD	ITIS Fermi	19/04/2016
Trivigno Rocco	Digital Electronics in sensors field	ITIS Fermi	22/04/2016
Trivigno Rocco	Sensors	ITIS Da Vinci	02/05/2016

SUMMER WORK

Surname Name	Specialization	Area	School
Oursana Ishac	Electronics	R&S	ITIS Fermi
Andreoli Roberto	Electronics	R&S	ITIS Fermi
Massarenti Edoardo	Electronics	Production	ITIS Da Vinci
Maccaferri Teresa	Electronics	R&S	ITIS Fermi
Sarcinelli Davide	Mechanics	R&S	ITIS Corni
Vignudelli Lorenzo	Electronics	Production	ITIS Fermi

ITIS LEONARDO DA VINCI IN CARPI, PROJECT "LET'S TRAIN A BUSINESS"

We started a cooperation with Technical Institute Leonardo da Vinci in Carpi regarding the Project work-linked training – Let's train a business - A project Work. Jessica Galantucci (Brand Label sales and Subsidiaries Manager) and Roberto Bosani (R&D Manager) took an active part in this project as company's tutors for students attending the third class. We invite you to visit the proper section of our website, for you to view the excellent final performances of the different students' teams. We greatly congratulate the students and their teachers!

OTHER ACTIVITIES

- M.D. is part of the Technical Scientific Committee of Fermi Institute
- M.D. is part of the Orientation Committee of Electronics Engineering degree course of UniMORE University
- M.D. is inside the UniMORE University network to host interns/students under dissertation
- M.D. is inside the UniBO University network to host interns/students under dissertation
- Work-linked training Project – Classes III ITIS Da Vinci Institute (Galantucci /Bosani)
- We cooperate with Polytechnic University in Milan

We cooperate with following institutes:

- Technical Industrial Institute Fermi in Modena
- Istituto Corni di Modena
- Istituto Da Vinci di Carpi

We cooperate with following teachers more closely:

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- prof.sa Floriana Fantuzzi (Da Vinci)
- prof.sa Simona Fregni (Da Vinci)
- prof. Marco Vidoni (Da Vinci)
- prof. Enrico Artioli (Corni)
- prof. Claudio Ferrari (Corni)

M.D. LEAN ACADEMY: WHY APPLY LEAN PRINCIPLES

Here is another chapter in the Lean Manufacturing series. With this series of tutorials, M.D. Micro Detectors highlights its application experience of Lean methodology. This tutorial, unlike the last published, does not address a specific aspect of this method of work organization, but it analyzes the overall strategic value through a reading of the results we have obtained.

We will continue to repeat loudly, that this method of work provides a competitive tool of great potential for European manufacturing companies. Lean thinking is an indispensable tool to make up the actual penalties, which the Italian manufacturing firms in particular must face in terms of economic and environmental context. These issues, which are upset an industrial system settled in a very long period of time, may be offset by a company whose asset mix are constituted by the existence of essential technology and product quality, which must be accompanied by a level of service, maximizing the efficiency, speed, flexibility, and reducing waste.

In our experience this has been achieved thanks to two fundamental pillars: the application of Lean principles and the strategy of vertical integration (i.e. perform internally, at our corporate site, all activities ranging from research and development through to delivery to the end customer).

In a nutshell, these were the results obtained by M.D. Micro Detectors S.p.A. thanks to the application of Lean:

1. Simplification, Standardization and Rationalization of processes and Performance measurement criteria;
2. Better process control, also played with more urgency;
3. Increase of Production Capacity, of Productivity and of the service level provided to the customer;
4. Reduction of time to market for new products, of catalog variants and of special products;
5. Efficiency improvement in all business areas;
6. Increased Flexibility, Responsiveness and Speed in all business areas;
7. Enhancement of human capital;
8. Improving of the work environment;
9. Constant application of Continuous Improvement approach;
10. Enhance business visibility.

Our experience leads us to testify that the Lean methodology:

1. is a necessary tool for companies to grow from all points of view;
2. is the most appropriate instrument to compensate for the typical crucial problems affecting the competitiveness of Italian manufacturing companies;
3. is closer to working and business culture of many Italian companies;
4. allows you to reconcile the essential business interests of producing profits and maximum optimization of human capital and professionalism of its workers;
5. is applicable to all companies, regardless of size and / or sector;
6. is a marketing tool: it provides great visibility to the Italian companies abroad and especially with large groups;
7. institutionalizes and makes the concepts of Continuous Improvement and Excellence Research alive.

The above points can be developed as follows:

1. **Tool for growth.** The application of typical principles and methodologies of Lean (Continuous Improvement, flow, standardization, 5S, Pull, etc.), if it is done with conviction, enables you to grow both in terms of volume of business and of performance at all levels.
2. **Antidote to criticality.** Lean is the appropriate tool to compensate the critical issues faced by Italian industrial enterprises. The actual penalties which they must face in terms of labor costs, taxation, heaviness and invasiveness of the "public machine", can be offset by the existence of product Technology and Quality, accompanied by the exaltation of a level of service that significantly increases the efficiency, speed, flexibility, and that reduces waste.

CLAUDIO GUERZONI
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CISTELAIER S.P.A.

3. **Affinities to the Italian work and business culture.** With the support of all the "modern media", Lean is a tool that allows to revive and enhance the culture of work and those professional values that have been at the base of the big Italian economic development, in particular for regions of Centre and North.
4. **Material Capital and Human Capital.** Lean is a tool that allows you to combine and enhance the corporate interests of:
   - Production of profits, which are a guarantee for the future, enabling the carrying out of investments;
   - Enhancement of human capital and professional skills of employees (through professional growth and the creation of working environments of excellence).

   M.D.'s experience says that the profitability of the company has increased (even in a context of tough competition) through the increase of performance and efficiency and at the same time the working environment conditions have strongly improved allowing a large number of people to grow professionally, increasing their performance and enhancing their professional skills. Besides they can also work in a cleaner, tidy, organized environment, where they can fuel the enthusiasm for the job.
5. **Applicability.** Lean is a tool which can be applied to any corporate reality, from the large ones to those of limited size, regardless of the sector (industrial or service). Our experience has shown that the Lean helps to enhance the typical strengths of small and medium businesses: short communication line, very short decision line, speed, flexibility.
6. **Marketing tool.** It is a competitive tool that allows Italian companies to better penetrate foreign markets and to approach large companies. As an international language that constitutes a business card, it allows you to speak the same language around the world. It can be truly an important tool for exalting the Italian spirit in its positive sense.
7. **Continuous Improvement and Excellence.** These concepts come in everyday work as a positive fever.

Finally we want to mention the benefits for the staff thanks to Lean implementation, again based on our background. In particular, we recorded the following aspects:

1. professional growth through the acquisition of a new methodology of highly skilled labor;
2. professional growth by assigning more responsibility. In our case, we proceeded to spread and re- distribute responsibilities, and to involve the people themselves in the design and performing the great change put into practice;
3. professional growth through the performance of new tasks (development of technical skills) and a larger number of tasks;
4. creating a more efficient and organized work environment, also neater and cleaner at the same time;
5. greater opportunities for economic growth as a result of company and professional growth;
6. work environment based on motivation, enthusiasm, result-oriented spirit, continuous improvement and pursuit of excellence;
7. increase of yr own visibility as well as of your company's one.

Another aspect we want to mention is that in the process of such a radical and deep change a strong commitment is essential from Senior Management and the company's Property to clarify from the beginning that the change will be irreversible and to continue the same without any procrastination. Equally it must occur for whole management, whom is required great cohesion to.

Last but not least, it is the involvement of more people in the process of change and in the future organization establishment. More people feel the architects of change and the more involved in achieving results they are as well as their contribution required, the greater will be the speed of action and the company growth, with consequent creation of a sound body of shared professional values.

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Micro Detectors

Italian Sensors Technology

M.D. Micro Detectors is an industrial group which has designed and produced a wide range of industrial sensors since 1971. M.D. has a great tradition but also a very visionary approach, thanks to their great entrepreneurship and innovating spirit.

The Group is composed of the head office, M.D. Micro Detectors S.p.A. (Modena), along with subsidiaries Micro Detectors Iberica SA (Barcelona) and M.D. Micro Detectors (Tianjin) Co. Ltd.

Our catalogue is composed of following product ranges:

- Photoelectric Sensors
- Proximity Sensors
- Ultrasonic Sensors
- Area Sensors
- Safety Devices
- Accessories
- Coils for inductive sensors

Technology, Quality, Service, Efficiency and Speed are the key words distinguishing our products and our companies.

In addition to the catalogue products, an important share of our activity is dedicated to special versions and custom products, with the aim to satisfy our customer's specific application needs.

Made in M.D. is another key point: from development of new products (or special version of catalogue products) up to final shipment, all activities are carried out internally by our staff.

The integrating strategy enables us to be present on the market with great Flexibility, Speed and Efficiency. This way we have a total control on our processes and technology, too.

The companies of our Group are organized and operate following the Lean Thinking principles, allowing us to offer our customers, our suppliers and all our partners an excellent service level.

More than 1.3 million pieces per year are completely realized in our plant in Modena.

The Made in Italy featuring our production means Quality, Accuracy and Reliability.

All products manufactured by our factory are subject to precise control standards during the production process, before the final test.

Working culture, focus on customer and on constant improvement, passion and excellence aptitude, continuous research: all of that is part of our staff professional background. All of that belongs to M.D. Style.

M.D. Micro Detectors Quality is also guaranteed by all the certificates our Company has achieved over time: our quality management system is ISO 9001:2008 certified and many products are CE, ATEX, UL, cULus,Diversey, TÜV and ECOLAB certified.

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