n.e.t.

innovative gas sensing

twenty years
of advanced solutions
for gas detection

20 YEARS ANNIVERSARY

IR INFRARED gas technology

D DYNAMIC gas technology

μ μPROCESSOR gas technology

BBS BLACK BODY gas technology

PRODUCT AND CORPORATE PROFILE

26.10.2021

THE MOST COMPLETE PORTFOLIO OF GAS SENSING SOLUTIONS ON THE MARKET TODAY

NET CORE TECHNOLOGIES – SENSING ELEMENTS

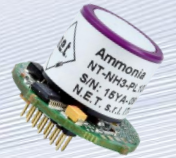
Technology: NDIR

Technology: Electrochemical

Technology: Catalytic

NET INTEGRATED SOLUTIONS – READY-MADE HIGH-LEVEL INTERFACES AND CERTIFIED ENCLOSURES

CYBER
Transmitter boards

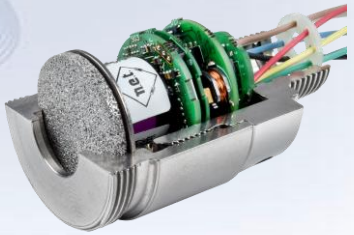


Single board
Voltage and
Mobdus TTL output

3-board
4-20mA and
Modbus RS-485 output

NET HEADS
Certified enclosures

ATEX/IECEX certified
Stainless Steel EX d
Enclosures



NET CYBER HEAD
Integrates CYBER
transmitter

WHY NET

- We design and manufacture a complete range of gas sensing devices for industrial and commercial applications, trusted by instrument manufacturers worldwide.

- Mission: setting new standards in the gas sensor market:
  - state-of-the-art technology,
  - high quality,
  - excellent technical support,
  - competitive pricing,
  - short and on-time deliveries.

- N.E.T. is a team of dedicated engineers and market specialists with extensive experience in gas detection. Together, we can provide the highest level of technical, integration and commercial support.

20 YEARS ANNIVERSARY

20 Years of NET
in the gas sensors market

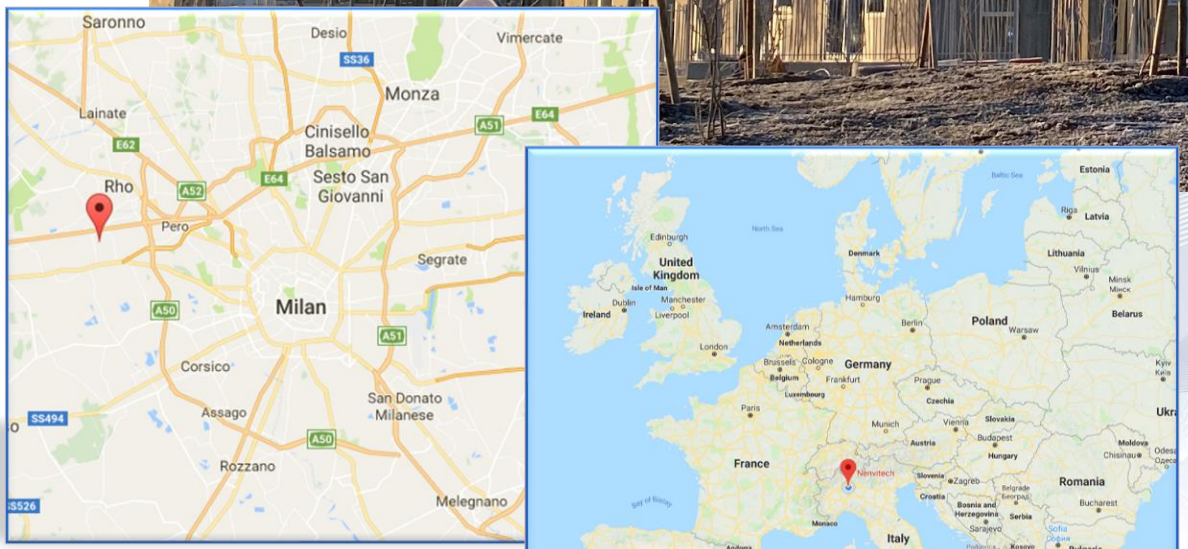
20 Years
of constant research
and ambitious projects

20 Years
dedicated to working closely
with our customers

20 Years
of attention to quality and
cost effective solutions

Gas Sensing Elements
Advanced solutions for gas detection since 2001

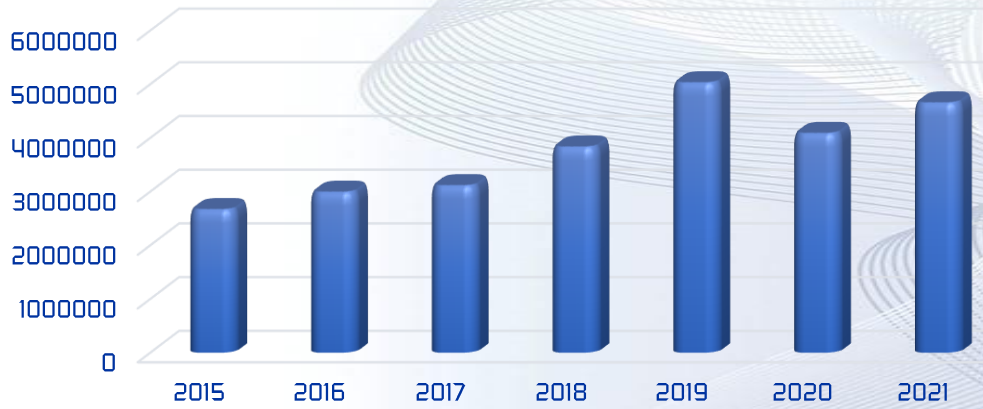
OUR HEADQUARTERS



- N.E.T. s.r.l.
- Via Campania, 5 | 20006
- Pregnana Milanese | MILANO | ITALY

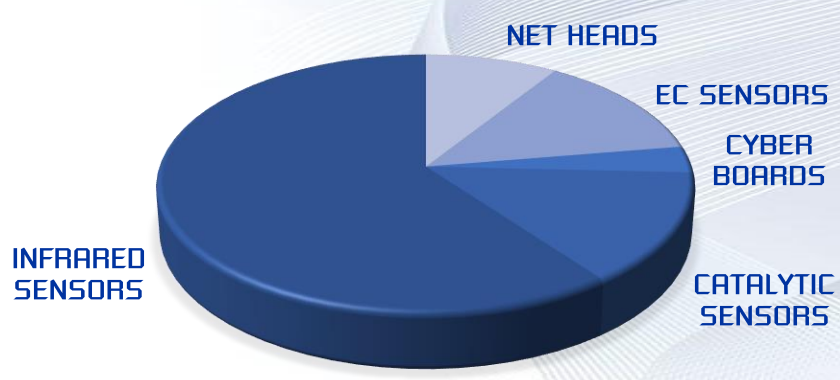
OUR NUMBERS

TURNOVER

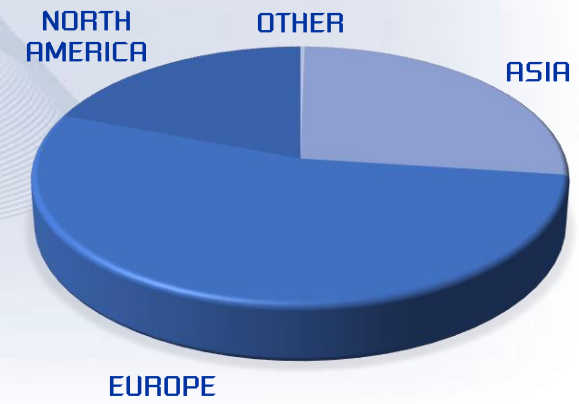


RESOURCES PER FUNCTION

SALES PER PRODUCT LINE



SALES PER AREA



OUR TECHNOLOGIES

Innovative Gas Sensing. By constant research and innovation, NET has developed distinctive and unique technologies. Incorporated everyday in our products, they enable exceptional benefits for our users.

INFRARED GAS TECHNOLOGY

- Non Dispersive Infrared (NDIR) gas sensing
- Dual wavelength, differential absorption technique
- Very gas-selective, low cross-sensitivity with interferent gases
- Corrosion-resistant and cannot be poisoned
- Fail-safe: events such as beam block or failed detectors or sources are revealed
- Requires no routine calibration

DYNAMIC GAS TECHNOLOGY

- Dependable detection accuracy over a full 0-100% volume range
- The sensor divides the 100% range in 3 different segments uses a different fitting curve for each one
- The set of coefficients for each range segment is individually determined for each sensor through the entire temperature range by an automated procedure

MICROPROCESSOR GAS TECHNOLOGY

- Sensors based on an ARM® Cortex®-M4 core platform with industry-leading low power
- High-level interface, with a standardized, linear output
- No need to process low-level signals and calculations
- Bidirectional communication via digital protocols allows changing of communication and calibration parameters
- Faster response time, with FW accelerator algorithm
- Enhanced dependability and fail-safe operation

BLACK BODY SOURCE TECHNOLOGY

- SF6, Ethylene and refrigerant gases have absorption bands in the spectrum of 8 to 10 µm.
- Our IREF series use a state-of-the-art MEMS-based IR source, featuring true blackbody radiation band.
- BBS emits in a wide wavelength range (2 to 14 µm)
- MEMS IR sources have superior speed and efficiency, smaller energy consumptions than filament lamps and excellent resistance against shocks and vibration

OUR CERTIFICATIONS

At NET, we believe that an organization's overall quality of work and processes is passed on to its products. This is why we maintain the industry's highest standards of certification, issued by the most renowned notified bodies.

ATEX

- The ATEX directive consists of two EU directives that have been law since July 2003 describing what equipment and workspace is allowed in an environment with an explosive atmosphere and sets the minimum safety standards for both the Employer and Manufacturer.
- NET products certified to the Atex directive include IRNET PRO 20mm and all NET Heads.

SIL

- Safety integrity level (SIL) is defined as a relative level of risk-reduction provided by a safety function, or to specify a target level of risk reduction. In simple terms, SIL is a measurement of performance required for a safety instrumented function (SIF).
- All NET Infrared sensors have reached a safety integrity level of SIL2, No other gas sensor on the market is provided with a higher, certified SIL capability, making our IR series the ideal choice for whoever is designing gas detection systems and SIL-rated functions aiming at the highest levels of functional safety

IECEx

- IECEx stands for International Electrotechnical Commission Explosive.
- is a voluntary system providing an internationally accepted means of proving compliance with IEC standards. The objective of IECEx standards is fostering international confidence in the product assessment process and maintaining the required level of safety.
- NET products certified to the IECEx directive include IRNET PRO 20mm and all NET Heads

ISO9001:2015

- The ISO 9000 family of standards addresses various aspects of quality management and contains some of ISO's best-known standards. The standards provide guidance and tools for companies and organizations who want to ensure that their products and services consistently meet customer's requirements, and that quality is consistently improved.
- N.ET. has been ISO 9001 certified since 2003.

OUR HISTORY

twenty years of advanced solutions for gas detection 20 YEARS ANNIVERSARY

2001
Founded as NEMOTOTECH, official distributor of Nemoto Ltd. Industrial electrochemical cells and pellistors

2002
New projects under development with the name Nemoto Environmental Technology (NET)

2003
NET achieves ISO 9001 certification for its quality management system

2004
Market launch of the NET2X and NET3X ATEX detector heads

2005
Market launch of the CYBER TRANSMITTERS

2007
Brand name changed to Nano Environmental Technology Srl

2008
Market launch of the IRNET-PRO infrared sensors

2011
NET obtains international patent for its NDIR optical path

2013
Market launch of the IREF-PRO infrared sensors

2018
New logo – INNOVATIVE GAS SENSING

2019
Market launch of the IREF-LITE infrared sensors

2022
New headquarters and factory

COMPLETE PRODUCT OVERVIEW

CORE TECHNOLOGIES	NDIR	 IRNET PRO 32mm	 IRNET PRO 20mm	 IRNEx PRO 20mm	 IREF PRO	 IREF LITE
	ELECTRO CHEMICAL		PREMIUM LINE Electrochemical Cells		SAFETY LINE Electrochemical Cells	
	CATALYTIC		SHM/SHP Pellistors Single Head – Safety Line		 SMM Pellistors Matched Pair – Industrial Line	
INTEGRATED SOLUTIONS	CYBER Transmitter boards		CYBER TTL Single board - Voltage and TTL output		 CYBER 4-20 3-board - 4-20mA and RS-485 output	
	NET HEADS Certified enclosures	 NET2X NETC2 20mm	 NET3X NETC3 32mm	 NETC3 CYBER HEAD	 NETC3/PB NYLON HEAD	 NETC3 IR HEAD
ACCESSORIES		      				

CORE TECHNOLOGIES - NDIR

IR INFRARED gas technology

µPROCESSOR gas technology

SIL2

NET IRNET-PRO

the sensor for industrial CO_2, CH_4, Refrigerants, Propane and hydrocarbon monitoring

Standard industrial accepted negative or positive **pinout**

Individual calibration and testing, for measurements you can trust

Internal microprocessor, for advanced signal processing

Standard industrial size, to fit existing detectors

Fast T90 response time, for critical and life-saving applications

Solid, rugged construction with **stainless steel** enclosure

Extended temperature range **(-40 to +60 °C)**, for use in any environment

SIL2 rated, for certified dependability (**fail-safe** detection)

ModBus or P2P digital communication, for ease of integration

CORE TECHNOLOGIES - NDIR

IR INFRARED gas technology

µPROCESSOR gas technology

SIL2

IRNET-PRO 32mm

the **sensor for industrial CO_2, CH_4, Refrigerants, Propane and hydrocarbon monitoring**

IRNET-P 32mm is N.E.T. **best selling** IR sensor and likely the most used in HVAC-R applications.

Its longer optical path provides better performances for:

- ❑ resolution
- ❑ Long-term stability
- ❑ humidity drift
- ❑ cross sensitivity

resulting in overall **stronger specifications** when compared to smaller sensors

MEASUREMENT RANGE	
METHANE LOW RANGE 0-100%LEL (4.4%vol) – 0-5%vol	PROPANE* 0-100%LEL (1.7%vol) – 0-2.1% vol
CO_2 LOW RANGE 0-2000ppm – 0-5000ppm – 0-1%vol – 0-2%vol – 0-5%vol	*N.E.T. can provide cross references factors to detect other hydrocarbons using a Propane sensor
Refrigerants 0-14.4%vol (R-32) – 0-11.9%vol (R-452b) – 0-7.7%vol (R-454b)	

CORE TECHNOLOGIES - NDIR

IRNET-PRO 20mm

***the* sensor for industrial hydrocarbon monitoring**

IRNET-P 20mm is N.E.T. IR sensor for whoever is looking for strong and dependable detection performances in a **standard 4-series size.**

The 0-100%Vol range version features N.E.T. DYNAMIC technology for the highest sensing accuracy ever seen in a compact sensor. DYNAMIC sensors also provide an optional digital output for Propane detection over 0-2.1%Vol range – the best option to detect different hydrocarbons using a cross-reference factor.

IR INFRARED gas technology

µPROCESSOR gas technology

DYNAMIC gas technology

SIL2

MEASUREMENT RANGE	
METHANE LOW RANGE 0-100%LEL (4.4%vol) – 0-5%vol	METHANE HIGH RANGE 0-100%vol
CO_2 LOW RANGE 0-5000ppm – 0-1%vol – 0-2%vol – 0-5%vol	CO_2 HIGH RANGE 0-20%vol – 0-100%vol
PROPANE* 0-100%LEL (1.7%vol) – 0-2.1% vol	*N.E.T. can provide cross references factors to detect other hydrocarbons using a Propane sensor
*Complete list: Acetic acid, Acetone, Benzene, Butadiene, Cyclo-hexane, Cyclo-pentane, Dimethyl Ether, Ethane, Ethanol, Ethyl acetate, Ethylene, Heptane, Hexane, Iso-butane, Isobutylene, Iso-octane, Iso-propanol, Methanol, N-butane, N-heptane, N-hexane, N-pentane, n-octane, Propylene, Toluene, Styrene, Xylene	

CORE TECHNOLOGIES - NDIR

IR INFRARED gas technology

µPROCESSOR gas technology

DYNAMIC gas technology

IECEx Ex SIL2

IRNEx-PRO 20mm

***the* sensor for industrial hydrocarbon monitoring**

IRNEX-P 20mm is N.E.T. solution for whoever is looking for an ATEX or IECEx certified IR sensor with strong and dependable performances both at low and high volume.

The 0-100%Vol range version features N.E.T. DYNAMIC technology for the highest sensing accuracy ever seen in a compact sensor.

Explosion proof Ex d IR sensor for surface (II 2G) and underground (I M2) classified areas.

CERTIFICATIONS	EN 50271 & SIL2 (TUV) APPROVED	ATEX/IECEx certificates	CESI 11 ATEX 039U / IECEx CES 12.0008U
	IEC 60079-29-1 PERFORMANCE	ATEX marking	II 2G Ex d IIC Gb, I M2 Ex d I Mb, I M1 Ex d+ia I Ma
	ATEX & IECEx certified (CESI)	IECEx marking	Ex d IIC Gb, Ex d I Mb, Ex d+ia I Ma

MEASUREMENT RANGE	
METHANE LOW RANGE 0-100%LEL (4.4%vol) – 0-5%vol	METHANE HIGH RANGE 0-100%vol
CO_2 LOW RANGE 0-5000ppm – 0-1%vol – 0-2%vol – 0-5%vol	CO_2 HIGH RANGE 0-20%vol – 0-100%vol
PROPANE* 0-100%LEL (1.7%vol) – 0-2.1% vol	*N.E.T. can provide cross references factors to detect other hydrocarbons using a Propane sensor
*Complete list: Acetic acid, Acetone, Benzene, Butadiene, Cyclo-hexane, Cyclo-pentane, Dimethy Ether, Ethane, Ethanol, Ethyl acetate, Ethylene, Heptane, Hexane, Iso-butane, Isobutylene, Iso-octane, Iso-propanol, Methanol, N-butane, N-heptane, N-hexane, N-pentane, n-octane, Propylene, Toluene, Styrene, Xylene	

n.e.t. innovative gas sensing

CORE TECHNOLOGIES - NDIR

IR INFRARED gas technology

µPROCESSOR gas technology

BBS BLACK BODY gas technology

SIL2

IREF PRO

Market's most DEPENDABLE refrigerant gas sensor now offers the most comprehensive range of detected gases available.

N.E.T. IREF implements N.E.T. advanced NDIR, BLACK BODY and MICROPROCESSOR technology to eclipse classic semiconductor (MOS) sensor performances:

- ❑ reducing maintenance costs (guaranteed 1-year calibration span),
- ❑ increasing sensor lifetime (MTBF of more than 5 years)
- ❑ making leak detection fail-safe
- ❑ offering the best gas selectivity available

MEASUREMENT RANGE			
ppm RANGE			0-100%LFL
SF_6 ❑ R-1233zd ❑ R-1234yf ❑ R-1234ze ❑ R-125 ❑ R-134a ❑ R-143a	❑ R-22 ❑ R-227ea ❑ R-32 ❑ R-404a ❑ R-407a ❑ R-407c ❑ R-407f ❑ R-410a	❑ R-417a ❑ R-422d ❑ R-448a ❑ R-449a ❑ R-452b ❑ R-454a ❑ R-507 ❑ R-513a	❑ R-1234yf ❑ R-1234ze ❑ R-32 ❑ R-452b ❑ R-454b ❑ R-454c ❑ R-455a
More gases detectable through cross-factor: R-422a, R-424a, R-427a, R-434a, R-438a, R-452a, R-454b, R-454c, R-455a, R-453a,R-442a,R-450a			

CORE TECHNOLOGIES - NDIR

IR INFRARED gas technology

µ µPROCESSOR gas technology

BBS BLACK BODY gas technology

IREF LITE

the new low-cost, high-performance NDIR sensor for A2L refrigerants

IREF LITE makes the **gas selectivity, accuracy, poison immunity** and **extended lifetime** of NDIR technology affordable for any setting, dramatically improving **gas detection performances**, increasing occupants' **safety** and lowering **cost-of-ownership**.

The IREF LITE series from N.E.T. include solutions for several A2L refrigerants in ppm and %LEL range.

MEASUREMENT RANGE	
ppm RANGE	0-100%LFL
❑ R-1234yf	❑ R-1234yf
❑ R-1234ze	❑ R-1234ze
❑ R-134a	❑ R-32
❑ R-32	❑ R-452b
❑ R-407a	❑ R-454a
❑ R-407c	❑ R-454b
❑ R-410a	❑ R-454c

CORE TECHNOLOGIES - ELECTROCHEMICAL

PREMIUM LINE for harsh environments (EN45544-2)

- Manufactured in **Japan** exclusively for N.E.T. and under our exact specifications
- Comply with performance requirements of **EN 45544-2** for harsh environments.
- Superior **stability**
- Long expected lifetime

MEASUREMENT RANGE	
NT-NH3-PL100	Ammonia - Range: 0-100 ppm
NT-NH3-PL300	Ammonia - Range: 0-300 ppm
NT-NH3-PL1000	Ammonia - Range: 0-1000 ppm
NT-NH3-PL5000	Ammonia - Range: 0-5000 ppm
NT-NO2-PL30	Nitrogen Dioxide - Range: 0-30 ppm
NT-NO2-PL10	Nitrogen Dioxide - Range: 0-10 ppm
NT-CL2-PL10	Chlorine - Range: 0-10 ppm
NT-H2S-PL100	Hydrogen Sulfide - Range 0-100 ppm
NT-SO2-PL20	Sulfur Dioxide - Range: 0-20 ppm
NT-CO-PL1000	Carbon Monoxide - Range: 0-1000 ppm

MEASUREMENT RANGE – SPECIAL SENSORS	
NT-H2S-PL100-HT	Hydrogen Sulfide - Range 0-100 ppm High Temperature range: -40°C +65°C.
NT-H2S-PL20-HT	Hydrogen Sulfide - Range 0-20 ppm High Temperature range: -40°C +65°C.
NT-CH2O-PL10	Formaldehyde - Range: 0-10 ppm
NT-C2H4-PL100	Ethylene - Range: 0-100 ppm
NT-H2O2-PL300	Hydrogen Peroxide - Range: 0-300 ppm
NT-SO2-PL100	Sulfur Dioxide - Range: 0-100 ppm
NT-CL2-PL05	Chlorine - Range: 0-5 ppm
NT-NO-PL300	Nitric Oxide - Range: 0-300 ppm

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CORE TECHNOLOGIES - ELECTROCHEMICAL

TÜVRheinland CERTIFIED

Tested and approved by
TUV Rheinland
Certificate No. S 459 2014 C2

SAFETY LINE for car park, room and air monitoring applications (EN50545-1)

- Our SAFETY LINE sensors are selected by N.E.T. and manufactured, on OEM basis, by the companies leading in the field, such as DD Scientific Ltd and Alphasense

MEASUREMENT RANGE	
NT-O2-A2 (2 years lifetime)	Oxygen - Range: 0-25% vol E.C. OEM (Alphasense for NET)
NT-O2-A3 (3 years lifetime)	Oxygen - Range: 0-25% vol E.C. OEM (Alphasense for NET)
NT-O2-SLI3 (3 years life time)	Oxygen - Range: 0-25% vol
NT-O2-SLF (5 years life time)	Oxygen—Lead Free - Range: 0-25% vol
NT-NH3-PL5000	Carbon Monoxide - Range: 0-1000 ppm
GS+4NO	Nitric Oxide - Range: 0-250 ppm

CORE TECHNOLOGIES - CATALYTIC

SHM/SHP Pellistors (Single Head – Safety Line)

- Consist of a matched pair of elements mounted on a single header and protected by a metal mesh filter.
- Have a standard 4-series enclosure (D20.4 mm x H100) to fit a standard gas detector.
- SHM housing is of stainless steel, while SHP's is of plastic.

NP-17SHM NP-17SHP	2 V - 175 mA - Single header pellistor with high temperature range (150°C/-40°C).
NP-18SHM NP-18SHP	Single header pellistor for hydrocarbon in % LEL range. Specific Ammonia and Hydrogen detection is possibile powering the sensor at a different Voltage (HC: 2.5 V - 180 mA I H_2: 1.6 V - 140 mA I NH_3: 2.2 V - 170 mA)
NP-30SHM NP-30SHP	2.0 V - 300 mA - Low cost version of NP-30SMM mounted on single header. Excellent long-term stability.

SMM (Matched Pair – Industrial Line)

- Consist of a matched pair of elements mounted on TO4 size headers and protected by a metal can.
- The matched pair is housed in standard 7-series plastic enclosure (Ø32 mm x H100) to fit a standard gas detector.
- Our NP-ACSMM is a special-purpose Pellistor sensor, designed to monitor %LEL levels of Acetylene with outstanding poison resistance.

NP-30SMM	2.0 V — 300mA - General purpose pellistor with poison resistance and excellent stability. Mounted in a 7 series plastic housing, diameter 32 mm
NP-18SMM	Specific Ammonia and Hydrogen detection is possible powering the sensor at a different Voltage (HC: 2.5 V - 180 mA I H2: 1.6 V - 140 mA I NH3: 2.2 V - 170 mA)
NP-17SMM	2.0 V — 175 mA
NP-ACSMM	2.0 V — 145 mA - Special purpose pellistor sensor designed to monitor % LEL levels of Acetylene, poison resistant.

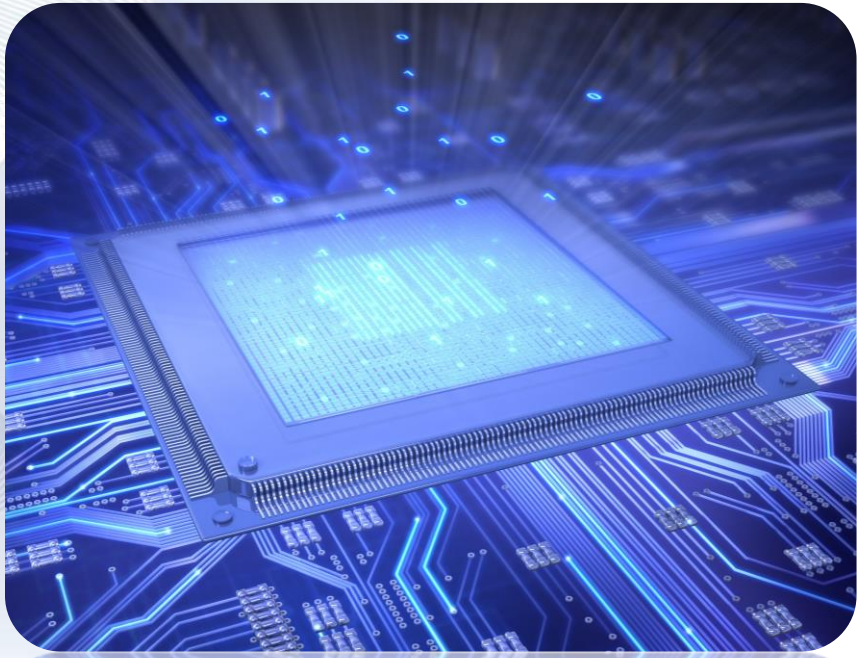
n.e.t.
innovative gas sensing

INTEGRATED SOLUTIONS
NET CYBER TRANSMITTER BOARD

MICROPROCESSOR DRIVEN ELECTRONIC INTERFACE TO TURN ANY GAS SENSOR IN A LEGITIMATE DETECTOR, WITH CURRENT, VOLTAGE AND DIGITAL OUTPUT, CONTACTS FOR FAULT AND ALARMS.

CYBER TTL TRANSMITTER

- 32 mm Ø, to fit industry standard 4- or 7-series sensors
- 0.8-4V analogue output
- MODBUS RTU interface UART TX and RX at TTL levels
- Power Supply 5Vdc ±5%
- Supplied complete with sensor, configured and pre-calibrated
- 3 Threshold Alarms, Fault Alarm, Watchdog



μPROCESSOR
gas technology

CYBER 4-20 TRANSMITTER

- 32 mm Ø, to fit industry standard 4- or 7-series sensors
- 4-20mA analogue output
- RS-485 MODBUS RTU interface
- Power Supply 12-24Vdc
- Supplied complete with sensor, configured and pre-calibrated
- 3 Threshold Alarms, Fault Alarm, Watchdog

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INTEGRATED SOLUTIONS - NET HEADS

READY-TO-USE, CERTIFIED DETECTION HEADS, ALSO AVAILABLE WITH BUILT-IN ANALOG AND DIGITAL OUTPUT.

NET2X/NETC2 DETECTION HEAD

Stainless Steel detection head for 20mm (4-series) gas sensor

- ATEX (NET2X) and IECEx (NETC2) full conformity certification
- ¾"or 1" back thread for connection to the detector's body
- Front M35 thread for connection to flanges and calibration caps
- Front sinter filter
- Optional GD protection (II 2GD and IP65)
- Completely sealed device

NETC3 DETECTION HEAD

Stainless Steel detection head for 32mm (7-series) gas sensor

- Decomposable in two parts, for easy sensor replacement
- ¾", 1"or M20 back thread for connection to the detector's body
- Front M46 thread for connection to flanges and calibration caps
- Front sinter filter
- Optional GD protection (II 2GD and IP65)
- ATEX and IECEx full conformity certification

Certificate number	CESI 10 ATEX 032X	IECEx CES 12.0009X
ATEX marking (only gas)	II 2G Ex db IIC T6 or T5 Gb	Ex db IIC T6 or T5 Gb(1)
ATEX marking (gas and dust, with dust cover)	II 2D Ex tb IIIC T85°C or T100°C Db IP65	Ex tb IIIC T85°C or T100°C Db IP65

INTEGRATED SOLUTIONS - NET HEADS

READY-TO-USE, CERTIFIED DETECTION HEADS, ALSO AVAILABLE WITH BUILT-IN ANALOG AND DIGITAL OUTPUT.

NET3X/NETC3 CYBER HEAD

Combines CYBER technology with the NET3X/NETC3 range of detection heads

- ❑ Available for all technologies and head body material
- ❑ Industry standard RS-485 MODBUS RTU interface
- ❑ Supplied ready to use, configured and pre-calibrated from NET's comprehensive range
- ❑ ATEX and IECEx full conformity certification

NETC3/PB DETECTION HEAD

IP65 certified enclosure for residential, commercial, light-industrial applications

- ❑ Decomposable in two parts, for easy sensor replacement
- ❑ ¾", 1"or M20 back thread for connection to the detector's body
- ❑ Front M46 thread for connection to flanges and calibration caps
- ❑ Available with CYBER technology
- ❑ Customizable color
- ❑ IP65 Rating (with test report certification)
- ❑ -40 +60°C environmental limits

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THANK YOU FOR YOUR ATTENTION