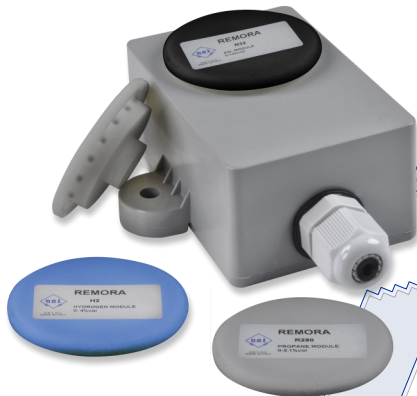




# REMORA® First

## Complete module for Refrigerant Leak Detection

D55334 Rev.0 dated 27/02/2024



### Key Features

- Oleophobic filter and oil spray cover ensuring maximum protection against dust and contamination
- NDIR gas detection: no false alarm, no regular routine maintenance required
- 15+ years of expected lifetime
- Over 30 different refrigerant gases available
- Supplied ready-to-use with a sensor configured and pre-calibrated from NET detection range
- Easy integration with 4-20mA analogue output and MODBUS protocol on RS-485
- Customizable interface (PokaYoka Automotive connector, NET standard connector, Cable)

### General Description

The new REMORA First from NET is a complete, ready to use and cost-effective sensor module aimed at making refrigerant leak detection easy, affordable and effective in any application.

REMORA is based on a glass reinforced, flame retardant IP65 Polyamide enclosure, complete with integrated mounting holes. The gas inlet is protected by an oleophobic filter and an oil spray cover. All this ensures maximum protection against shocks, dust and contamination in any possible environment and application scenario.

REMORA gas detection is based on NET range of NDIR sensors – by a distance, the most complete on the market today, covering over 40 different common refrigerants across multiple platforms and detection ranges. NDIR detection ensures unparalleled gas selectivity, poison immunity, fail safe operation, long term stability and extended lifetime (15+ years). The sensing part is microprocessor based, providing a linearized and temperature-compensated reading, as well as complete diagnostics information while running constant self-check and self-calibration routines.

NET has now over 10 years of experience in detecting refrigerants with NDIR technology and can

offer the best integration support available.

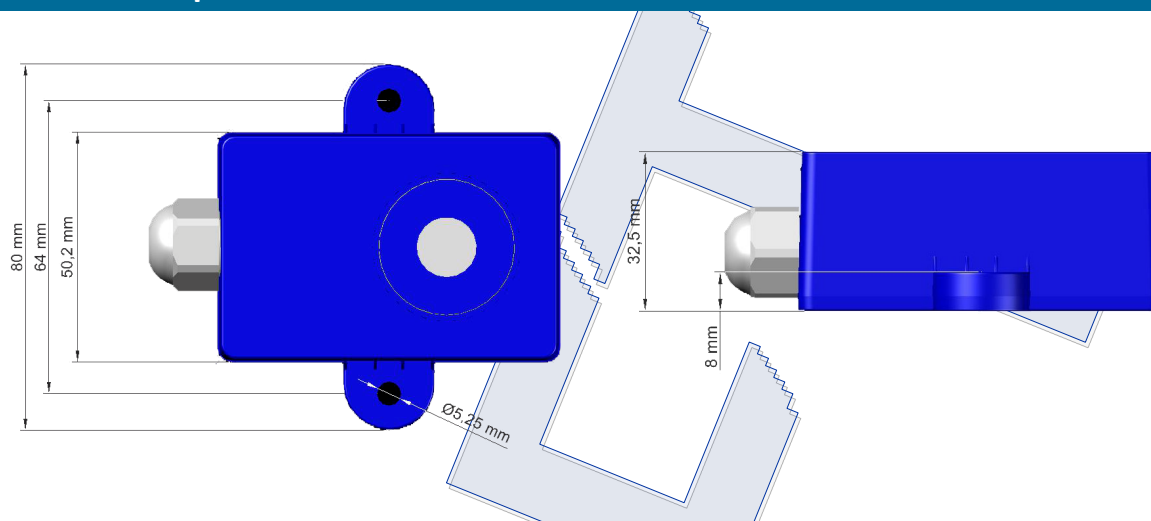
The REMORA module has a high-level interface with industry-standard 4-20mA analogue output and MODBUS protocol on RS-485, as well as local Threshold, Watchdog and fault alarm outputs. The power supply rating is 12...24VDC. The unit can be customized with different interface options, such as PokaYoka Automotive connector, NET standard connector and cable.

All the above makes the Remora sensor an ideal solution for any refrigerant leak detection solutions, from direct integration in HVAC/R equipment such as chillers, rooftop units or heat pumps, to environmental monitoring in cold rooms, machinery rooms or refrigerated transports as well as occupied spaces such as hotel rooms, hospitals or office buildings.

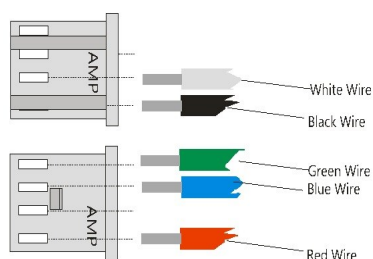
REMORA is undergoing the highest level of certification to ensure best-in-class reliability in Refrigerant Leak detection:

- ◇ IEC60335-2-40:2022 Annex LL.
- ◇ EN 61508:2010 Parts 1-7, EN 50402:2017 (SIL2).
- ◇ EN 61326 Part 1, EN 50270 (Electromagnetic compatibility).
- ◇ EN 60529:1991 (IP protection)

## Mechanical specifications



## Wiring scheme



Wire colour	Remora board version
Red	Vcc (12/24V)
White	Signal (4-20mA current)
Black	Gnd
Green	RS485A
Blue	RS485B

Standard Connector:  
AMPMODU II 280365

Mating connector:  
AMPMODU II 280384-1

## Certification details

Safety Certification	Test report number	Pending
	Reference standards	IEC60335-2-40:2022 Annex LL
Safety Integrity Certification	Test report number	Pending
	Reference standards	EN 61508:2010 Parts 1-7, EN 50402:2017
EMC Certification	Test report number	Pending
	Reference standards	EN 61326 Part 1, EN 50270
IP Certification	Test report number	Pending
	Reference standards	EN 60529:1991-10+corr 1993+A1:2000+A2:2003+AC:2016

## Product specifications

General	<b>Sensing Element:</b>	NDIR sensor	
	<b>Operating temperature range</b>	IRNET Pro: -40 +60°C IREF Pro: -20 +50°C IREF Lite: -10 +50°C	(see table at page 3)
	<b>Storage temperature range</b>	-40 +85°C	
	<b>Maximum temperature cycle variations</b>	± 1°C/min	
	<b>Operating humidity range</b>	0-95% non condensing	
	<b>Operating pressure range</b>	800-1200 mBar	
	<b>Enclosure</b>	25% Glass Reinforced, Flame Retardant, Polyamide 66	
	<b>Enclosure Protection</b>	IP65	
	<b>Calibration</b>	Individually calibrated with temperature compensation. Test report supplied.	
	<b>Weight</b>		
	<b>MTBF</b>	> 15 yrs (IR Source MTTF > 15 years)	
Measurement	<b>Sensing method</b>	NDIR	
	<b>Range</b>	ppm; %vol	
	<b>Response time</b>	T <sub>90</sub> <30 seconds	
	<b>Digital to analog error</b>	±2%F.S	
	<b>Accuracy</b>	IRNET PRO / IREF PRO: ±1% of FS range for readings below 25% of range ±2% of FS range for readings below 50% of range ±5% of FS range above 50% of range  IREF LITE: ±5% of FS range below 50% F.S ±7% of FS range above 50% F.S	
	<b>Resolution</b>	IRNET PRO / IREF PRO:	0.2% of F.S range
		IREF LITE:	0.5% of F.S range
	<b>Temperature Performance</b>	IRNET PRO / IREF PRO: ±3% of FS range for readings below 50% of range ±5% of FS range above 50% of range  IREF LITE: ±7% of FS	
<b>Pressure dependence</b>	0.1 % to 0.2 % value per hPa		
Electrical	<b>Power Voltage</b>	Nominal 12-24Vdc	
	<b>Current Consumption @12V</b>	<80 mA Idc	
	<b>Current Consumption @24V</b>	<40 mA Idc	
	<b>Warm up time</b>	60 s for full operation @ 25 °C 1 hour for full specification @ 25 °C	
	<b>Max output current</b>	24 mA	
	<b>Output load resistor range</b>	100-350 Ω	
	<b>DC output impedance</b>	30 Ω	

## Product specifications (continued)

Signal Output	Analog output	4-20mA
	Digital communication	Modbus protocol RS485 (Termination resistance of 120Ω normally present)
	Baud Rate	4800;9600;19200;38400 bps

## Available gases

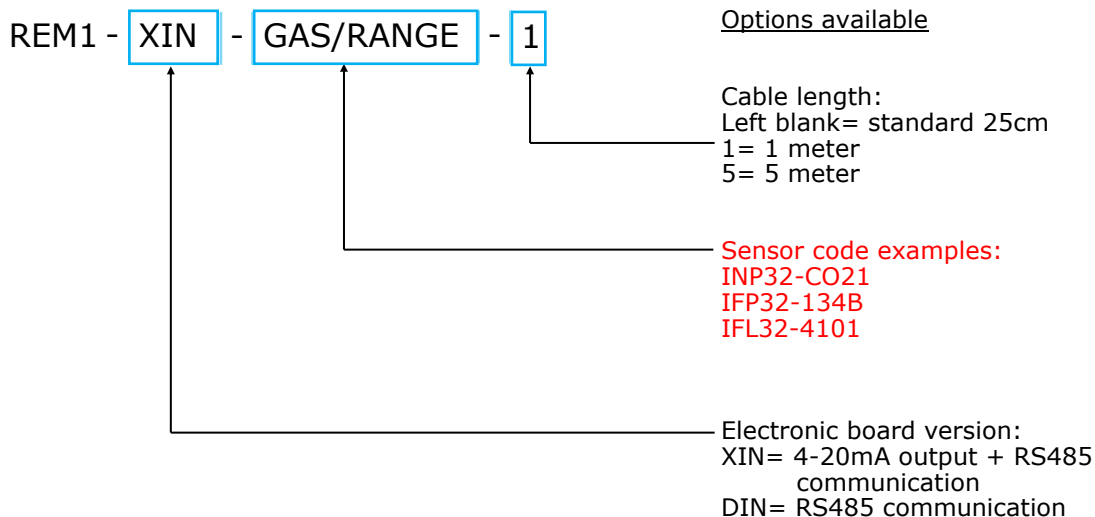
GAS	TYPE	CLASS	RANGE / PLATFORM				
			IREF PRO		IREF LITE		IRNET PRO
R-1233zd	HCFO	A1	0-2000ppm				
R-1234yf	HFO	A2L	0-2000ppm	%LFL (0-6.2%vol)	0-5000ppm	%LFL (0-6.2%vol)	
R-1234ze	HFO	A2L	0-2000ppm	%LFL (0-6.5%vol)	0-5000ppm	%LFL (0-6.5%vol)	
R-125	HFC	A1	0-2000ppm				
R-134a	HFC	A1	0-2000ppm		0-5000ppm		
R-143a	HFC	A2L	0-2000ppm				
R-152a	HC	A3					%LFL (0-3.7%vol)
R-22	HCFC	A1	0-2000ppm				
R-227ea	HFC	A1	0-2000ppm				
R-236fa	HFC	A1	UNDER DEVELOPMENT				
R-290	HC (Propane)	A3					%LFL (0-2.1%vol)
R-32	HFC	A2L	0-2000ppm	%LFL (0-14.4%vol)	0-10000ppm	%LFL (0-14.4%vol)	
R-404a	HFC	A1	0-2000ppm		0-5000ppm		
R-407a	HFC	A1	0-2000ppm				
R-407c	HFC	A1			0-5000ppm		
R-407f	HFC	A1	0-2000ppm				
R-410a	HFC	A1	0-2000ppm		0-10000ppm		
R-417a	HFC	A1	0-2000ppm				
R-422d	HFC	A1	0-2000ppm				

Available gases (continued)

GAS	TYPE	CLASS	RANGE / PLATFORM		
			IREF PRO	IREF LITE	IRNET PRO
R-448a	HFC / HFO	A1	0-2000ppm		
R-449a	HFO	A1	0-2000ppm	0-5000ppm	
R-450a	HFC / HFO	A1	0-2000ppm		
R-452a	HFO	A1	0-2000ppm		
R-452b	HFO	A2L	0-2000ppm	%LFL (0-11.9%vol)	
R-454a	HFO	A2L		%LFL (0-6.3%vol)	%LFL (0-6.3%vol)
R-454b	HFO	A2L	0-2000ppm	%LFL (0-7.7%vol)	%LFL (0-7.7%vol)
R-454c	HFO	A2L		%LFL (0-6.2%vol)	%LFL (0-6.2%vol)
R-455a	HFO	A2L		%LFL (0-11.8%vol)	%LFL (0-11.8%vol)
R-507	HFC	A1	0-2000ppm		
R-513a	HFO	A1	0-2000ppm		
R-514a	HFO	B1	UNDER DEVELOPMENT		
R-600	HC (Butane)	A3			%LFL (0-1.4%vol)
R-600a	HC (IsoButane)	A3			%LFL (0-1.3%vol)
R-744	CO2	A1			0-1% - 0-5%vol
R-1270	HC (Propylene)	A3			%LFL (0-2.0%vol)

## Ordering details

When making an order, we kindly ask our customers to specify the basic physical and electrical properties that are needed for their specific application. This is made through the part number here below. The squared fields of the part number below can be modified according to the options on the right.



## Warranty and warning

The WARRANTY of the product is 3 years from the purchased date against defects in materials or production. This warranty however is not valid for articles that have been broken, repaired by a third person or not used according to the instructions contained in this document or supplied with the products, related to the storage, installation, operation, maintenance, or servicing of the products.

Recalibration of the sensor will void the calibration warranty

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