WEATHER
STATIONS

BUILD YOUR OWN SYSTEM

T +44 20 8551 7000
E INFO@MUNROINSTRUMENTS.COM
W WWW.MUNROINSTRUMENTS.COM

MUNRO
INSTRUMENTS

WEATHER
STATIONS

IM170-PRO
WIND SPEED & DIRECTION

PAPERLESS RECORDER

DATALOGGER

Paperless recorder

The Paperless Recorder (PR) is a data acquisition unit with a 5.6" TFT touch screen. It is designed for use with our range of meteorological sensors. The PR offers multiple real-time and historical views, as well as numerous archiving strategies to ensure data is never lost. Using the associated PC software, the user can view live data, generate reports, set alarms and configure the PR unit.

PC Software

Powerful and versatile software allow the user to view and analyse data from the sensors. Configuration of the PR is also possible.
Key features: Live data monitoring (includes trending, with scalable time axis between 1 minute and 1 month). Historical review of data.
Customizable display screens: Configure the PR to display data in your chosen format. Choose from a variety of different display styles.
Configure alarms and relay outputs.
Download data for analysis offline.
Configuration wizards for easy set-up and troubleshooting.

DIRECTION

DIRECTION

359
DIRECTION

95
10 MIN

HOME
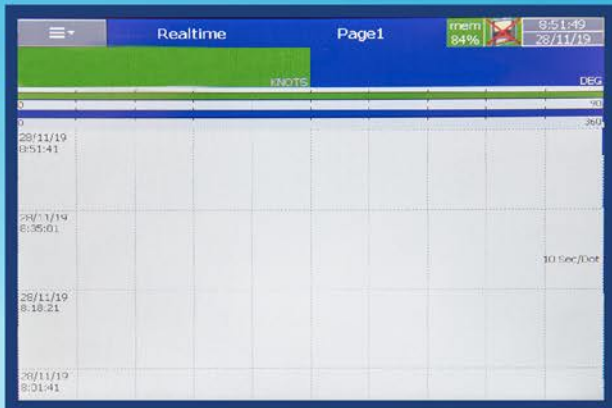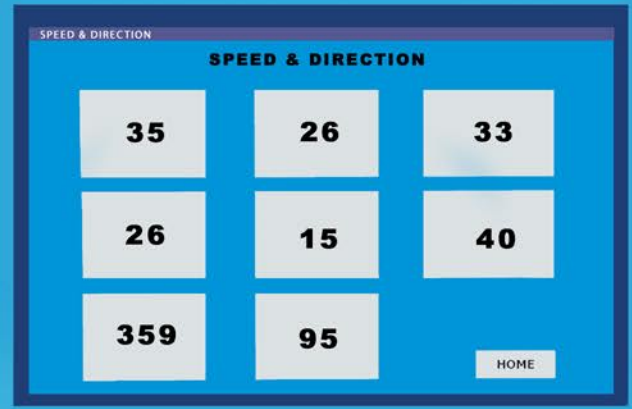
Specification	Description
Power	90-250VAC or 11-36VDC
Display	5.6" TFT touch screen
Resolution	640 x 480 pixel resolution, 65K colour
Internal Memory	256 MB
RAM	256 MB
External Memory	SD card, USB x 2
Ethernet	Modbus TCP/IP
Sampling Rate	100 ms max
Maths Channels	Yes
Protection	IP65 front, IP20 rear
Operating Temperature	0°C to 50°C

150/IM147 IN-LINE
CUP ANEMOMETER & WIND DIRECTION VANE

Product Description

The IM147 is a dual in-line unit comprising an IM124 Cup Anemometer and IM145 Wind Direction Vane. It transmits wind speed and wind direction measurements to remote dial indicators and displays.The IM147 can be used with the following display modules:

• Up to 6 x IM124A Wind Speed Dial Indicators

• Up to 6 x IM125A Wind Direction Dial Indicators

• 150/DAS Digital Graphical Recorder

• A suitable data logger (4-20 mA output)

The sensor itself is extremely robust and has an expected lifetime of several decades It is particularly suited to coastal and cyclonic areas. The wind speed range is 0-180 knots. It is a near-identical model to our acclaimed IM146 and is used around the world by meteorological offices, airports, shipping terminals, offshore rigs, bridges etc.

Technical Specifications

Start Threshold	3±1 Knots
Speed Range	0-180 Knots
Speed Accuracy	Below 40 Knots ±1 Knot, Above 41 Knots ±2 Knots
Direction Range	0-360º
Direction Accuracy	±1º
Operating Temp	-40ºC to + 100ºC
Operating Humidity	98% non-condensing
Combined Height	840 mm
Fin Tip Axis	790 mm
Fixing	2 inches BSP internal
Weight	16.25kg

IM124
CUP GENERATOR ANEMOMETER

Product description

Requiring no external power source, the IM124 Cup Anemometer generates an output signal that is directly proportional to the wind speed. Each IM124 can drive up to six IM124A Wind Speed Dial Indicators. It can also be used as part of a complete IM147 system.
Constructed from non-ferrous materials resistant to corrosion in salt-laden and high humidity atmospheres

Technical Specifications

Start Threshold	3±1 Knots
Speed Range	0-180 Knots
Speed Accuracy	Below 40 Knots ±1 Knot, Above 41
Knots	±2 Knots
Weight	4.2Kg

IM145
WIND DIRECTION VANE ENCODER

Product description

The IM145 Wind Direction Vane is a sensitive, reliable unit of robust construction, which transmits wind direction measurements to a high degree of accuracy. It can drive up to six IM125A Wind Direction Dial Indicators using an external AC supply. It can also be used as part of a complete IM147 system. Constructed from non-ferrous materials resistant to corrosion in salt-laden and high humidity atmospheres able to withstand a near-miss lighting strike

Start Threshold	3±1 Knots
Direction Range	0- 360º
Direction Accuracy	±1º
Weight	12 kg

150/IM147 IN-LINE CUP ANEMOMETER AND VANE

Product Description

Munro's flagship wind speed & direction sensor is a dual in-line unit, comprising an IM124 Cup Anemometer and an IM145 Wind Direction Vane. By virtue of its accuracy and durability, it has become one of the world's most widely distributed wind sensors, having served meteorological offices, airports, offshore rigs, power stations, ports and harbours worldwide for over fifty years.

Its rugged, corrosion-resistant design means that it is fully operable even in the most adverse of environments, including heavily salt-laden atmospheres and lightning-prone areas. The system requires little to no maintenance and can be powered independently using sustainable methods. This means the sensor can be deployed remotely and left completely unattended.

Wind Speed Sensor

The IM124 Cup Anemometer is a self-powered, electro-mechanical unit, capable of measuring wind speeds of up to 180 Knots (equivalent to 200 mph, 90 m/s and 320 km/h). The rotor turns within a fixed stator coil assembly, producing an AC current which varies with the speed of the rotor. This generates an output voltage which is proportional the the wind speed. The unit is non-directional. The IM124 is available as a stand-alone unit.

Wind Direction Sensor

The IM145 Wind Direction Vane is a sensitive yet robust element, employing a magnetic encoder to give high accuracy wind direction measurements.

Technical Specifications

Specification	Description
Wind Speed Range	0-90 knots / 0-180 knots Full Scale Range (F.S.)
Wind Speed Accuracy	±1 knot < 40 knots, ±2 knots > 41 knots
Wind Speed Resolution	1 knot
Wind Speed Start Threshold	4±1 knots
Anemometer Dimensions	267 mm (Height), 228 mm (Axis to Outer Cup Edge), 127 mm (Cup Diameter)
Anemometer Weight	4.2 kg
Wind Direction Range	0-360°
Wind Direction Accuracy	±1°
Wind Direction Resolution	1°
Wind Direction Start Threshold	3±1 knots
Wind Vane Dimensions	585 mm (Height), 790 mm (Axis to Fin Tip), 375 mm (Axis to Balance Weight)
Wind Vane Weight	12 kg
Operating Temperature	-40°C to +100°C
Power Consumption (wind direction)	10 mA
Power Supply	Mains or 16/32/64 Ah Lithium Ion Battery 3.6 V or 50/100/200 Ah Rechargable Battery or External Sustainable Energy Supply

150/W20 2-AXIS ULTRASONIC ANEMOMETER (0-60 M/S)

Product Description

This durable 2-Axis Anemometer facilitates the measurement of wind speed & direction and the U-V Cartesian components of wind speed. Operating according to the ultrasonic principle, it is unaffected by inertia and can therefore detect extremely low wind speeds to a high degree of accuracy.

The sensor requires a 10-30 VDC power supply, making it particularly suitable for remote applications. As it contains no moving parts, this ultrasonic anemometer can be left for up to two years without the need for maintenance or re-calibration. Furthermore, the sensor has a very small power draw. It is therefore ideal for remote solar-powered or wind-powered systems.

This lightweight sensor can be fitted to any 40 mm diameter pole/mast. The inbuilt compass makes installation and alignment quick and easy.

The sensor has a temperature operating range of -40°C to +60°C. Optionally, it can be fitted with a heater to prevent the accumulation of ice and snow in low temperatures.

The sensor outputs can either be analogue 0-1 V, 0-5 V, 4-20 mA. Alternatively, the serial outputs are RS232 and RS 485 following communication protocols SDI-12, MODBUS or NMEA.

This instrument can also be supplied with integrated sensors to measure temperature, relative humidity, barometric pressure and solar radiation (please state if this functionality is required when requesting a quotation).

Technical Specifications

Specification	Description
Wind Speed Range	0-60 m/s
Wind Speed Resolution	0.01 m/s
Wind Speed Accuracy	±2% (<35 m/s), ±3% (>35 m/s)
Wind Direction Range	0-359.9°
Wind Direction Resolution	0.1°
Wind Direction Accuracy	±2°
Power Supply	10-30 VDC
Power Consumption	26 mA @ 12 VDC
Analogue Outputs	0-1 V, 0-5 V, 4-20 mA
Digital Outputs	RS232, RS485, SDI-12, MODBUS-RTU
Operating Temperature	-40°C to +60°C
Environmental Protection Rating	IP66

150/T10 PRECISION HYGROMETER

Product Description

This highly precise hygrometer is an excellent solution for those who need to monitor humidity and temperature.

Humidity is measured by a capacitative sensor made up of a hygroscopic polymer. The sensor works by detecting changes in the dielectric constant, which is directly proportional to the relative humidity of the surrounding environment. The advantages of this type of sensor include insensitivity to temperature changes, quick response time and durability.

The temperature sensor is a platinum resistance thermometer (100Ω at 0℃). The Pt100 resistance variation is transformed into a current or voltage signal, linear to temperature.

Technical Specifications

Specification	Description
Humidity Sensor Type	Capacitive Hygroscopic Polymer
Humidity Measuring Range	0-100% RH
Humidity Accuracy	±0.15% (0-90% RH)
Humidity Sensor Working Temperature	-40℃ to +60℃
Hysterisis and Repeatability	0.4% RH
Long Term Stability	1%/ year
Response Time at 63% of Final Variation	3 minutes with filter, 6 seconds no filter
Temperature Sensor Type	4 wire Pt 100 1/3 DIN
Temperature Measurement Range	-40℃ to +60℃
Temperature Accuracy	±0.15ºC, ±0.1% of measurement
Temperature Stability	0.2℃/ year
Outputs	Analogue: 4-20 mA; Digital: RS232 or RS485 MODBUS RTU
Power Supply	10-40 VDC
Consumption	2 mA
Environmental Protection Rating	IP65

150/B10 BAROMETRIC PRESSURE SENSOR (500-1200 hPA)

Product Description

This Barometric Pressure Sensor uses a high-accuracy temperature-compensated piezoresistive silicon sensor. It gives precise measurements of atmospheric pressure in the range 500 hPa to 1200 hPa.

With an integrated temperature element, the sensor offers excellent thermal stability, providing consistent results across the entire operating temperature range (-40°C to +85°C).

It is suitable for all indoor and outdoor applications (e.g. clean rooms, internal combustion engines, laboratories)

and can be used as a stand-alone sensor or as part of a larger environmental monitoring system with other sensors from the Munro 150 Series.

Housed in an IP67 enclosure, the sensor is ideal for remote applications. It requires very little power (10-30 VDC) and can be powered by solar cells. It communicates via SDI-12 protocol, allowing for data transmission across large sensor networks.

Technical Specifications

Specification	Description
Sensor Type	High-accuracy piezoresistive silicon sensor
Measurement Range	500-1200 hPa
Resolution	0.01 hPa
Accuracy	± 0.4 hPa, in the entire temperature operating range -40°C to +85°C
Digital Output	RS485 and RS422 (with MODBUS-RTU and NMEA protocols), RS232 (with standard NMEA protocol), SDI-12. Please specify.
Analogue Output	0-5 V, 1-5 V, 0-20 mA, 4-20 mA
Long Term Stability	0.25 hPa/year
Turn on time	Approx 2 s from powering
Response Time	16 ms
Supply Voltage	10-30 VDC
Absorption Current	<10 mA for analogue or modbus measurements, 200 μA for SDI-12 protocol between measurements
Operating Conditions	-40°C to +85°C, 0-100 % RH
Media	Dry air and non-corrosive media
Overload Pressure	3 x full scale
Environmental Protection Rating	IP67