

Sensors & Systems Solutions

M_ApCO₂



Photograph courtesy of the National Oceanic and Atmospheric Administration (NOAA) Central Library.

Ocean acidification and global climate change are very real issues affecting multiple industries today. From the oil and gas industry and academia to industrial fisheries and wildlife sanctuaries, scientists and technical experts are charged with monitoring the level of carbon dioxide (CO₂) in the ocean to understand the impact of changing chemistry on aquatic life.

This marine autonomous partial pressure CO₂ (M_ApCO₂) monitoring system provides air and aqueous partial pressure carbon dioxide (pCO₂) measurements for remote ocean environments. Originally designed by MBARI, this approach of measuring the partial pressure of CO₂ gives scientists an idea of whether the ocean is acting as a source or sink of CO₂ (relative to the atmosphere) at a given place and time. Such fluxes of CO₂ vary dramatically from place to place and over time.

NOAA/PMEL enhanced the device by adding a reference calibration gas and two-way satellite data transmission capabilities to control the system and receive data in near real-time. Currently, NOAA has more than two dozen M_ApCO₂ monitoring systems deployed on a variety of buoys around the world. NOAA is using this analytical instrument to develop a global array of moored observation systems to determine air-sea flux in support of the Global Ocean Observing System (GOOS).

Battelle Commercialized the M_ApCO₂ system in 2008 and ran the build to order manufacturing of the system from 2009 to 2018. In response to the need for systems and support of the M_ApCO₂ system, Sensors & Systems Solutions has taken on the task of supporting the ocean science community with the manufacture and support of the M_ApCO₂ instrument.



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Specifications and Features



Monitors surface air and aqueous pCO ₂ concentrations
100-750 ppm measurement range (extended range on request)
~1 ppm precision
0.01 ppm resolution
0 - 40°C operational temperature
Capable of 12-18 months of autonomous operation
Compact flash memory storage
Equipped with precision CO ₂ reference gas
Tied to World Meteorological Organization standards
Optional Iridium satellite communications Link
Optional battery pack
Modular design for interchangeability and customization
Rugged design for long term ocean deployment

Sensor & Systems Solutions' MApCO₂ monitoring system enables scientists to understand the changing chemistry of the oceans and the impacts of ocean acidification on marine ecosystems. These efforts are intended to predict how marine ecosystems will respond and develop management strategies for adapting to the consequences of ocean acidification.



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