Solution:

The solution we provide is an intelligent nitrogen level sensor integrated with the breathing regulator.

The intelligent sensor contains two major components, one is the flow capacity and concentration sensor, the other is a microcomputer with preprogramed chip. The device will be integrated inside the breathing regulator so that whenever the diver inhales and exhales, all the gas will go through this censor.

Under initialization, the device will ask the user his/her body weight, then estimates the total volume of blood in the user’s body. When the user is underwater, the device will detect the flow speed of inhaling and exhaling along with the nitrogen concentration respectively, the computer calculates the exact amount of nitrogen of each whole breath, then derives the difference of the amount of nitrogen and add it up to the accumulated nitrogen. Once the accumulated nitrogen has reached the level that will soon go beyond the tolerance of the diver but still enables the diver enough time for safe surfacing, the device will alarm the diver by creating loud sound and beaming red lights to warn the diver. Then the diver will follow the instruction of the device to complete his/her safe stopping and finally, safe surfacing.