

IT Edge Computing
Industry 4.0
WISE-PaaS
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Service IoT
Embedded IoT
Cloud-IoT
iCity
XNavi
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EnSinaF
AI Wireless
IoT Device Manager
WIST-PaaS Marketplace
Intelligent Healthcare
Ready
Design-in Services
Customer Care
DeviceOn
I.APP
AI Platform
Logistics
WISE-STACK
INDUSTRY 4.0

Contents

1. Background
2. Product Introduction
3. 5 Features for the Wireless Vital Sign Solution
4. Wireless Vital Sign Solution Overview
5. Product Function - Oximeter Box/Wear The Oximeter Module/Display
6. Integration with iWard Solutions
7. Benefit for Wireless Vital Sign Solution

1. Background- Pulse Oximeter

- A pulse oximeter is a medical device that indirectly monitors the oxygen saturation of a patient's blood (as opposed to measuring oxygen saturation directly through a blood sample) and changes in blood volume in the skin, producing a photoplethysmogram that may be further processed into other measurements. The pulse oximeter may be incorporated into a multiparameter patient monitor. Most monitors also display the pulse rate. Portable, battery-operated pulse oximeters are also available for transport or home blood-oxygen monitoring.
- Pulse oximetry is particularly convenient for noninvasive continuous measurement of blood oxygen saturation. In contrast, blood gas levels must otherwise be determined in a laboratory on a drawn blood sample. Pulse oximetry is useful in any setting where a patient's oxygenation is unstable, including intensive care, operating, recovery, emergency and hospital ward settings, pilots in unpressurized aircraft, for assessment of any patient's oxygenation, and determining the effectiveness of or need for supplemental oxygen.
- Because of their simplicity of use and the ability to provide continuous and immediate oxygen saturation values, pulse oximeters are of critical importance in emergency medicine and are also very useful for patients with respiratory or cardiac problems especially COPD, or for diagnosis of some sleep disorders such as apnea and hypopnea.



1. Background- SpO₂ Monitoring @ COVID-19

- Scientists have found a possible explanation for why some COVID-19 patients experience extremely low, otherwise life-threatening levels of oxygen, known as happy hypoxia, but no signs of difficulty in breathing. A study published in The American Journal of Respiratory and Critical Care Medicine in 2020 stated that the new understanding of the condition, also known as silent hypoxemia, could prevent unnecessary intubation and ventilation in patients during the current and expected second wave of coronavirus.
- During the ongoing coronavirus disease (COVID-19) pandemic, reports in social media and the lay press indicate that a subset of patients are presenting with severe hypoxemia in the absence of dyspnea, a problem unofficially referred to as "silent hypoxemia." To decrease the risk of complications in such patients, one proposed solution has been to have those diagnosed with COVID-19 but not sick enough to warrant admission monitor their arterial oxygenation by pulse oximetry at home and present for care when they show evidence of hypoxemia.
- WHO(World Health Organization) released an interim guidance - On the Use of Pulse Oximetry in Monitoring Covid-19 Patients Under Home Based Isolation and Care in 2021 Apr.



WORLD HEALTH ORGANIZATION REGIONAL OFFICE FOR AFRICA SUPPORTS THE COVID-19 RESPONSE

WHO/AFRO: Response to COVID-19 outbreak

Interim Guidance for Member States - On the Use of Pulse Oximetry in Monitoring Covid-19 Patients Under Home-Based Isolation and Care

April 2021

Continuous SP02 Monitoring becomes a MUST!

1. Background- Who needs SpO₂ Monitoring?



Ward Patient

- Spot Check for general wards and outpatients,
- Patients who need oxygen therapy in any special unit other than the operating room, or when performing sedation in dialysis, cardiopulmonary rehabilitation room, radiology, dental and microscopy centers, etc.



Baby

- Routine screening for newborns suffering from Critical CHD.
- Prevent premature babies from blindness caused by mistakes in oxygen supply in the incubator.
- Prevent the occurrence of Sudden Infant Death Syndrome (SIDS).



Obstructive Sleep Apnea

- Simple preliminary diagnosis and severity determination of Sleep Apnea Syndrome



Chronic Obstruction
Pulmonary Disease (COVID-19)

- Simple preliminary diagnosis and severity determination of Sleep Apnea Syndrome
- Elderly-patients with various chronic diseases and disability

2. Product Introduction

The Advantech Wireless Vital Sign Solution is a wearable, wireless monitoring system that continuously checks blood oxygen saturation and pulse rate (PR) once per second.

Real-time vitals are visible on the system display unit, and alarms sound when PR or SpO₂ move outside of the preset limits, which are customizable for the needs of each patient. The Wireless Vital Sign Solution is ideal for one-on-one patient-doctor monitoring.

AIM-75H



ADVANTECH

3. 6 Features for the Wireless Vital Sign Solution



1

CONTINUOUS MONITORING

Real-time data of key vitals, blood oxygen saturation (SpO2) and pulse rate, are collected once per second



2

WIRELESS AND WEARABLE

Comfortable wearable technology without the risk of tangled wires or cords



3

EFFECTIVE ALARMS

Alarm notifications with audible and visible signaling help facilitate early intervention



4

BATTERY

22 Hour rechargeable battery, 3 hours to charge fully.



5

EASY INTEGRATION

Vital sign data can be easily integrated with iWard solutions and hospital EMR systems.



6

MEDICAL CERTIFICATION

U.S. FDA approval and CE Class II certification ensure HIPAA compliance



4. Wireless Vital Sign Solution Overview



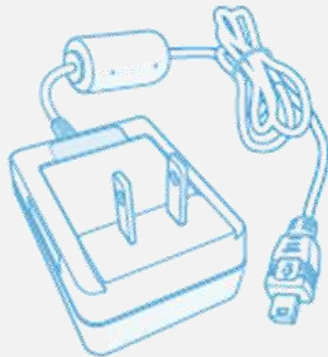
Note: The Oximeter Box must be used within 10 meters (32.8 feet) from the Display Unit.



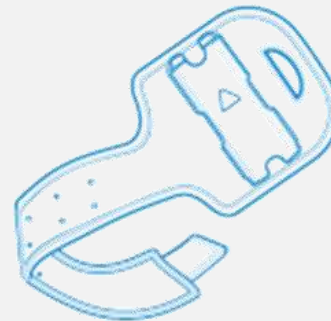
AIM-75H



Oximeter Box (OB)



Charging Adaptor-Oximeter Box



Wristband

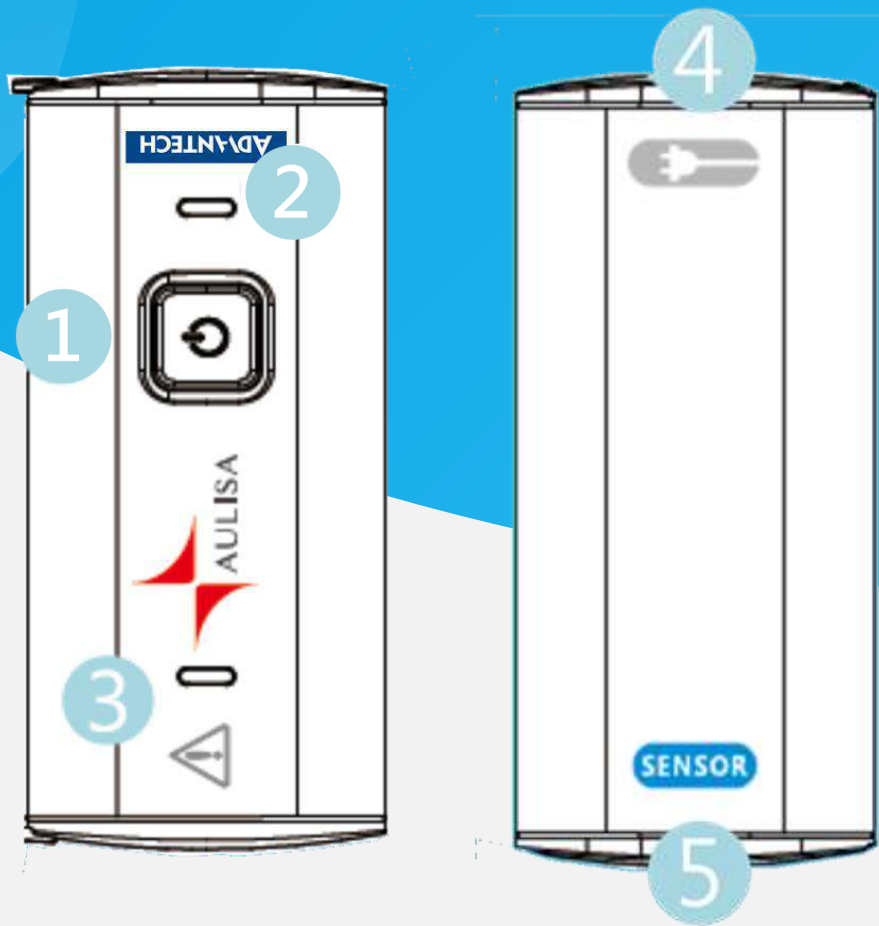


Adult Oximeter Sensor Cable



Pediatric Oximeter Sensor Cable

5. Product Function-Oximeter Box



Front View

Back View

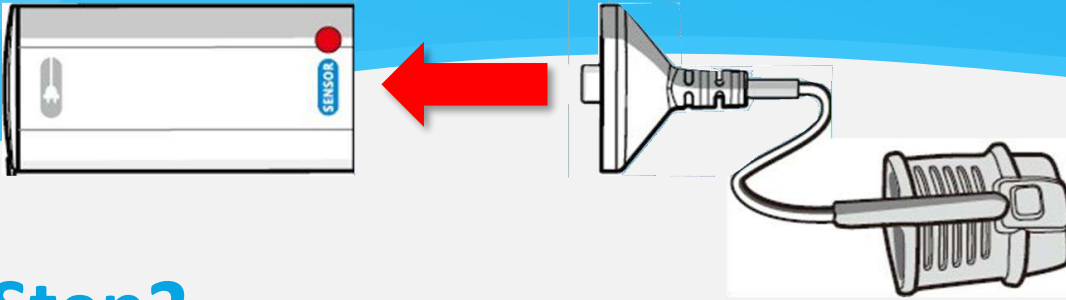
- ① Power button
- ② Power LED
- ③ Alarm LED
- ④ Charging port
- ⑤ Sensor cable port

Status	LED Color
Charging	Blue
Fully Charged	Off

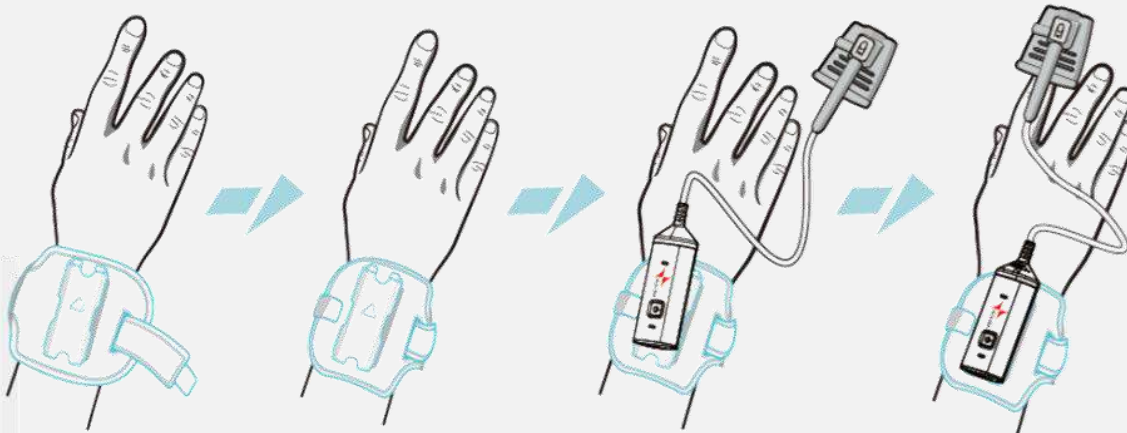
Status	LED Color
Power On	Green

5. Product Function-Wear The Oximeter Module

Step1



Step2



Note:

1.The wristband should be worn with the arrow indicator facing towards the patient's hand.

2.Attach the sensor probe to the thumb or finger , making sure that sensor cable runs over the top of patient's hand.

5. Product Function - Display



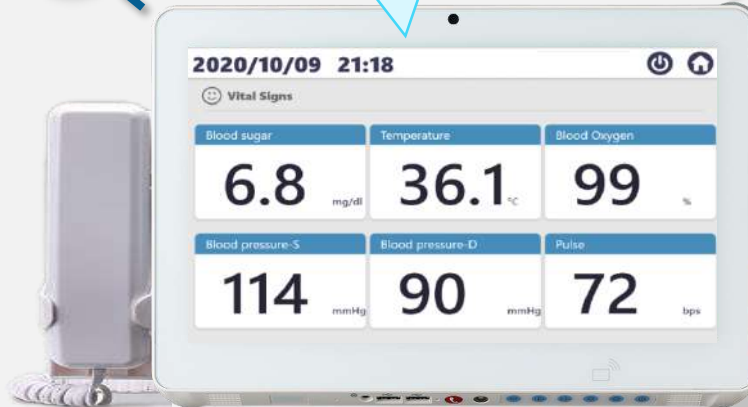
6. Integration with iWard Solutions

Wireless Vital Sign Solution

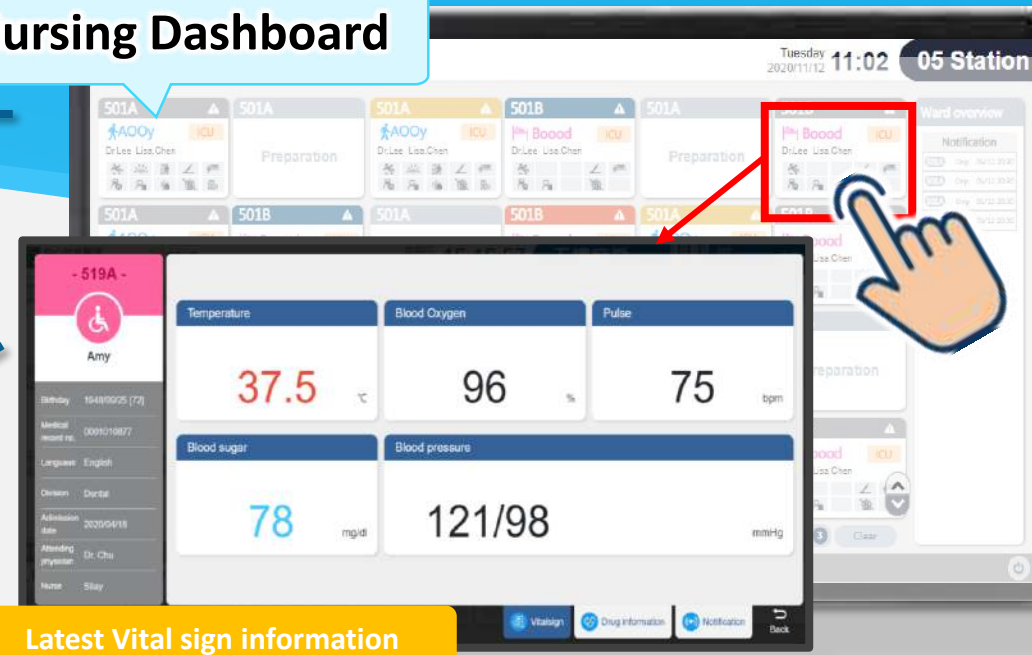
iWard Solutions



Patient Information Terminal



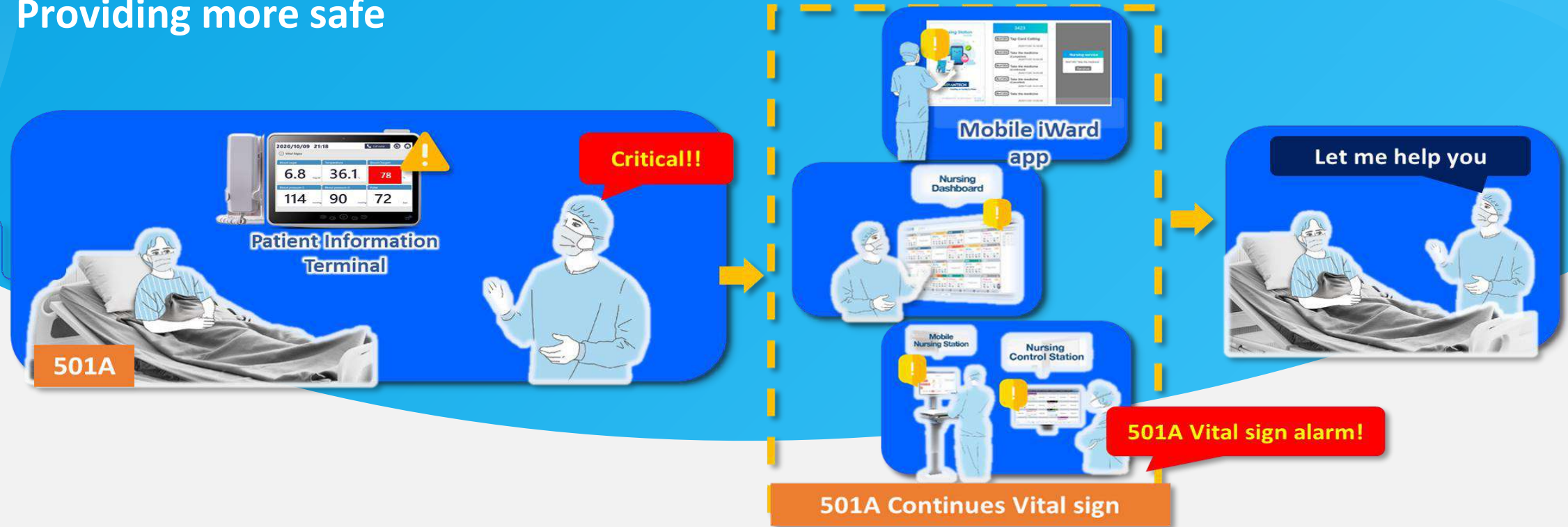
Nursing Dashboard



Latest Vital sign information

7. Benefit for Wireless Vital Sign Solution:

Providing more safe



Real-time data
observing



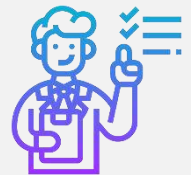
Providing an
opportunity for early
intervention



Preventing
unnecessary contact



Raising patient and
nurse safety



Reducing work loading

ADVANTECH

Appendix



Appendix 1 : Product Spec

Dimensions	0.7" x 1.3" x 2.7" (16mm x 32mm x 68mm)
Weight	1 oz (28g)
Ingress Protection	IP22
Display Range	
Blood Oxygen Saturation (SpO₂)	1% to 100%
Pulse Rate	30 to 290 bpm
Accuracy	
Blood Oxygen Saturation (SpO₂)	70-100% ±3 digits
Pulse Rate	±3%
Measurement Wavelengths and Output Power	
Red	660 nanometers @ 1.8 mw nominal
Infrared	905 nanometers @ 2 mw nominal
Battery Type	3.7V battery
Battery Life	22 hours of continuous operation
Temperature	
Operating	+5°C to +40°C
Storage/Transportation	-25°C to +70°C

Humidity	
Operating	15% to 90% R.H. non-condensing
Storage/Transportation	10% to 93% R.H. non-condensing
Operating Altitude	altitude ≤ 3000 m
Atmospheric Pressure	700 hPa to 1013 hPa
Wireless Communication	
Range	32.8 feet (10 meters) spherical radius
Protocol	Bluetooth 4.0
Direction	Bi-direction
Data rate	Up to 100kbps
Classifications per IEC 60601- 1	
Type of Protection	Class II, MOPP (on AC power) Internally powered (on battery power)
Type of Protection	Type BF-Applied Part
Mode of Operation	Continuous

Appendix 2 :

1. Care and Maintenance

The advanced digital circuitry within the Oximeter Module requires no calibration or periodic maintenance. Field service or repair of this system is not possible. Do not attempt to open the case of Oximeter Module for that will cause damage and void the warranty. If the Oximeter Module is not functioning properly, see “Troubleshooting” section for more information.

2. Cleaning and Disinfection

Clean and disinfect the Oximeter Sensor Cable before each use. First, lightly wipe the surface of the Oximeter Sensor Cable with a soft cloth dampened with rubbing alcohol for cleaning. Secondly, disinfect the surface of the Oximeter Sensor Cable with a soft cloth saturated with a solution of 10% chlorine bleach in tap water. Lastly, allow the device to dry thoroughly before reuse.

Appendix 3 : Trouble shooting

Problem	Possible Solution
Cannot turn on the Oximeter Module	<p>Press the Power button again.</p> <p>Fully charge the Oximeter Box until the LED blue light goes off.</p>
<p>Unable to obtain a valid SpO₂ or pulse rate reading</p> <p>NOTE: In some instances, perfusion of person being monitored may be inadequate for pulse detection.</p>	<p>Reposition the sensor probe or reinsert the finger and keep the hand motionless for at least 10 seconds.</p> <p>Position the sensor probe at a different site.</p> <p>Make sure the Oximeter Sensor Cable is attached to the finger and Oximeter Box securely.</p> <p>Check the Oximeter Sensor Cable for any visible signs of deterioration.</p> <p>Warm the application site by rubbing or covering with a blanket.</p> <p>Allow the hand to rest comfortably without squeezing or pressing the sensor probe on a hard surface.</p> <p>Make sure the Oximeter Module is within 32.8 feet (10 meters) spherical radius to the Display Unit.</p> <p>Reduce or eliminate any interference. Make sure the Oximeter Module is NOT placed on the same arm being used for other medical therapies or diagnostics (e.g. blood pressure cuff).</p> <p>Check the Display Unit for any alarms or error messages.</p> <p>Check if the Oximeter Module is in low power.</p> <p>Verify the system's wireless connection.</p>
Unstable or constant SpO ₂ and Pulse Rate readings	<p>Shield the sensor probe from any light source.</p> <p>Attach the sensor probe to a finger without fingernail polish or an artificial nail.</p> <p>Position the sensor probe at a different site.</p> <p>Make sure the Oximeter Sensor Cable is attached to the finger and Oximeter Box securely.</p> <p>Check the Oximeter Sensor Cable for any visible signs of deterioration.</p> <p>Reduce motion.</p>
“---” appears on the vital sign displays	<p>Make sure the Oximeter Sensor Cable is attached to the finger and Oximeter Box securely.</p> <p>Position the sensor probe at a different site.</p> <p>Make sure the Oximeter Module is within 32.8 feet (10 meters) spherical radius to the Display Unit.</p>
Data update period has exceeded the limit	<p>Reposition the sensor probe or reinsert the finger and keep the hand motionless for at least 10 seconds.</p> <p>Position the sensor probe at a different site.</p> <p>Attach the sensor probe to a finger without fingernail polish or an artificial nail.</p>
Cannot establish system connection	<p>Make sure the Oximeter Module is within 32.8 feet (10 meters) spherical radius to the Display Unit.</p> <p>Turn off the system and retry.</p>

Co-Creating the Future of the IoT World

