



Monitor

Operator's Manual

Before operating, please read this manual carefully.
Please keep this manual safe for future reference.

Product Name: InSight Vet Vital Signs Monitor

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Chapter I Overview

1.1 Introduction

The InSight Vet Vital Signs Monitor is mainly used to measure blood pressure, SpO₂, temperature, pulse rate and CO₂. This monitor is suitable for Dogs, Cats, Horses, Cattle, Sheep and Pigs, and could be applied in the operational bed and cage with the optional configuration-wall mount clip.

WARNING This equipment must be operated by a professional veterinarian or trained veterinary professionals.

NOTE The illustrations in this manual may be slightly different than the actual device due to device revision.

Safety

Degree of protection against electric shock: Type BF Applied.

The monitor is suitable for suitable for Dogs, Cats, Horses, Cattle, Sheep and Pigs Vital Signs Monitoring.

Under the spot measurement mode, it stores up to 100 patients' data (200 data sets per patient). Under the monitoring mode, it stores 48 hours of measurement data with a user friendly, easy to use interface with 3.5" colour TFT screen and data review functions,

including data listing and data trend chart.

Under audio and visual alarm mode, the red light flashes when power is low. When measuring data beyond the alarm limit, the font of the result data becomes red with audio alarm. The user can turn alarms on or off as required.

 **Note**

The device will shut off automatically under spot measurement mode within 3 minutes of inactivity.

Chapter II Main Parts & Accessories

2.1 Button and Indicator Light



Fig. 2.1.1 Button and Indicator Light

- Power Switch

Switch on/off

- Mute

Press this key to suspend or resume the alarm loudspeaker

- Function 1

Carry out functions as indicated by text showing on the lower left corner of screen

- Function 2

Carry out functions as indicated by text showing on the lower right corner of screen

- Select

Choose different options on setting menu

- Alarm Light

Red light flashes when alarm sounds

- Power Light

Red light flashes when charging or in low power.
Green light flashes when fully charged. No flashing under normal conditions

2.2. Power Socket



Fig. 2.2.1 Power Socket

Note

Please only use the power adapter supplied. Do not use device while charging.

2.3. Reset Micro USB



Fig. 2.3.1 Reset Micro USB

Open the protecting shell and plug a needle into the reset hole. Press hard, the device will be reset.

2.4. Ports

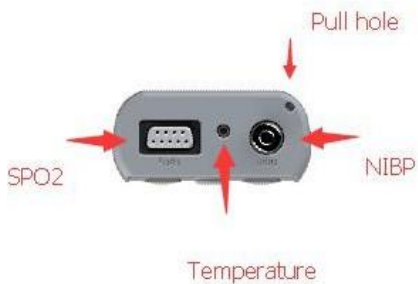


Fig. 2.4.1 Ports

2.5. Mounting Hole



Fig. 2.5.1 Mounting Hole

 **Note**

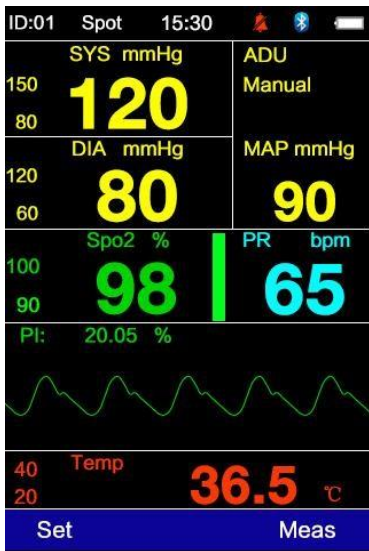
Mounting hole is used with accessories from other manufacturers such as accessories on stand of infusion pump.

2.6. Accessories

- A. Veterinary Cuff, 5pcs
- B. NIBP Extension Hose, 1pc
- C. SpO2 sensor, 1 pc
- D. Temperature Probe, 1 pc
- E. Power Adapter, 1pc
- F. User Manual, 1pc

Chapter III Interface

3.1 Main Interface



 **Note**

After the internal memory is full, the earliest records will be overwritten.

3.2 NIBP Measurement Interface

When measuring NIBP, the MAP bar displays real-time blood pressure data and current measurement information.

3.3 NIBP Measurement Result Interface

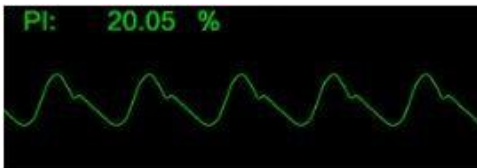


If there is a blood pressure measurement error, the device will show an error code on the screen.

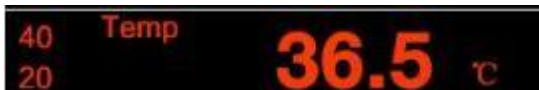
 **Note**

When SpO2 sensor is plugged in, the pulse rate is from the SpO2 calculation; otherwise the pulse rate is from blood pressure calculation.

3.4 SpO2 Measurement Interface



3.5 Temperature Measurement Interface



3.6 System Menu

Turn on the device, press “Set” button to enter the system setup menu.



Fig. 3.6 System Menu

3.6.1 Work Mode Setup

SPOT & Monitoring Mode

Under SPOT mode, the device will shut off automatically with no measuring operating within 3 minutes, otherwise the results are recorded once every 30 seconds.

Under Monitoring mode, the device works continuously, the results are recorded once every 2 seconds.

3.6.2 NIBP Setup

Measure Mode: Manual, Auto, Stat

Vet Type: Large animal, medium, small

Pressure Unit: mmHg, KPa

Measuring Interval: Measuring interval can be set under AUTO Mode,

3.6.3 Temperature Unit

°C, °F

3.6.4 Alarm Setup: Set the Alarm Limit of Each Parameter

Set Alarm	
SYS ALM HI(mmHg)	160
SYS ALM LO(mmHg)	90
DIA ALM HI(mmHg)	90
DIA ALM LO(mmHg)	50
SpO2 ALM HI(%)	100
SpO2 ALM LO(%)	90
TEMP ALM HI(°C)	39.0
TEMP ALM LO(°C)	35.0
PR ALM HI(bmp)	120
PR ALM LO(bmp)	50

Back OK

Fig.3.6.4 Alarm

SYS alarm range: 40~280mmHg

DIA alarm range: 10~220mmHg

SpO2 alarm range: 0%~100%

Temperature alarm range: 18~45°C

(64-113°F)

Pulse rate alarm range: 0~250BPM

3.6.5 System Setup: System Parameters Setup

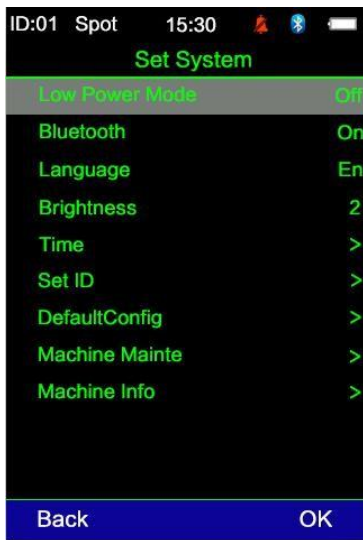
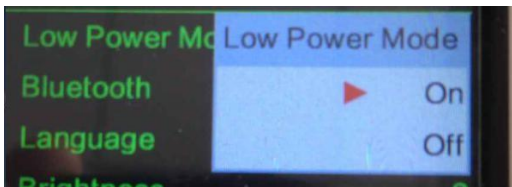


Fig. 3.6.5 System Setup

Low Power Mode

Under SPOT mode with low power mode on, the device will shut off automatically with no measuring operating within 3 minutes. If low power mode is off, it will not shut off.



Note

Under Monitoring mode, Low Power Mode is unavailable.

Bluetooth: On/Off

Note

The Bluetooth function is not available in current version of device.

Language: English, Chinese

Brightness: Level 1, Level 2

Time: Adjustable

Set ID (under SPOT mode): Select ID, New ID, Delete ID

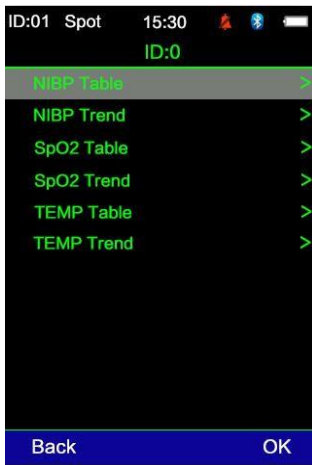
Default Configuration:

To restore the default factory settings

Machine Maintenance: password “0000”

Machine Information: Version No.

3.6.6 Review: Measurement Results Review



Choose “OK”, System will return to “Review” Menu:



Fig.3.6.6 Review Menu

3.6.6.1 Table

NIBP Table: Time, SYS, DIA, PR

SpO2 Table: Time, SpO2, PR

Temperature Table: Time, TEMP

3.6.6.2 Trend Chart

NIBP Trend Chart



Fig.3.6.6.1 NIBP Trend Chart

The trend chart shows SYS, DIA and pulse rate by different colour, the left vertical axis represents the NIBP, the right vertical axis represents the pulse rate. The

horizontal axis represents time, the trend chart includes ID, Pages, Date (time range in this page), to view all the data through all the pages.

SpO2 Trend Chart

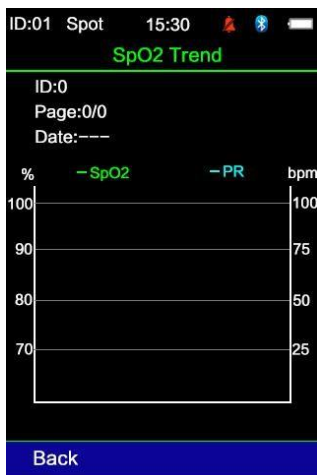


Fig.3.6.6.1 NIBP Trend Chart

The SpO2 trend chart displays SpO2 and pulse rate. The left vertical axis is oxygen saturation in percent, the right vertical axis is pulse rate, the horizontal axis is the measurement time.

Temperature Trend Chart

The temperature trend displays temperature data, the unit is either Fahrenheit or Celsius.

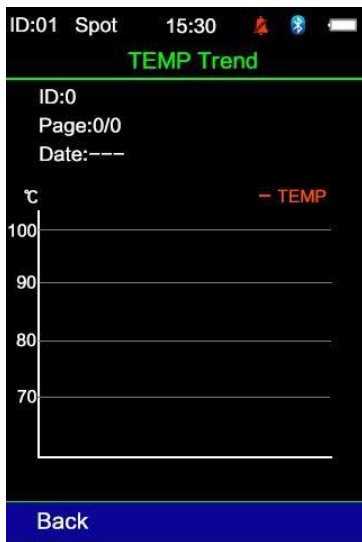


Fig.3.6.6.2 Temperature Trend Chart

Chapter IV NIBP Measurement

4.1 General

- NIBP monitoring adopts oscillometric technology
- Measurement Mode: Manual, Auto
- Measure systolic, mean, diastolic blood pressure and pulse rate
- Applies to Dogs, Cats, Horses, Cattle, Sheep and Pigs.

Warning

- Do not measure NIBP on patients with sickle-cell disease or with any skin damage.
- Select the correct species type. Especially for small animals, do not apply the higher vet inflation, over-pressure limits of measurement time

4.2 NIBP measurement

Warning: Make sure the inflatable hose is connected with the cuff and the monitor, and the hose is not folded or twisted.

1. Insert the inflatable hose into the NIBP socket.
2. Secure the blood pressure cuff on the patient's limb (Fig. 4.2.1):

- ◆ Make sure that the cuff is completely deflated.
- ◆ Adjust an appropriate cuff size for the patient, and make sure that the symbol “ Φ ” exactly on the appropriate artery. Ensure that the cuff is not wrapped too tightly. Otherwise, it may

cause Ischaemia.



Fig. 4.2.1 Cuff Usage

 **Note**

The width of the cuff should be 40% of the appendage circumference in dogs and 30% in cats, using the forelimb, hindlimb or tail. Using a cuff that is too large will tend to give falsely lower blood pressure readings and vice versa.

Vet Reusable NIBP Cuff:

Species Type	Circumference	Cuff Width	Hose
Cat	10~19cm	8cm	1.5m
Dog	18~26cm	10.6cm	
Sheep	25~35cm	14cm	
Bovine	33~47cm	17cm	

Equine	46~66cm	21cm	
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Veterinary Disposable NIBP Cuff:

Size	Circumference	Cuff Width	Tube Length
1	3~6cm	2.5cm	1.5m
2	4~8cm	3.2cm	
3	6~11cm	4.3cm	
4	7~13cm	5.1cm	
5	8~15cm	6.0cm	

Make sure that the cuff size is within the range.

3. Connect the cuff and the inflatable hose. It is recommended that the tail is used for taking the measurement or alternatively the chosen limb

should be placed at the same level as the patient's heart.

You can adjust the

measurement results as below:

- ◆ If the cuff is placed higher than the heart level, add 0.75mmHg (0.10kPa) per each centimetre gap.
- ◆ If it is placed lower than the heart level, deduct 0.75mmHg (0.10kPa) per each centimetre gap.

4. Check the correct NIBP measurement mode that is suitable for your species type.

5. Press the Function 2 button to start testing

4.3 Operation Instruction

1. Perform Automatic Measurement

User can set the measurement interval time to start

automatic measurement. System will work according to the interval time.

2. Stop Automatic Measurement

During automatic measurement, press the STOP button to stop measuring, system will start next automatic measurement after 30 seconds.

3. Perform Manual Measurement

- ◆ Press the 'Meas' button to start the manual measurement
- ◆ During the non-working time of the automatic measurement, press the 'Meas' button to start manual measurement. If you press the STOP button later, the system will stop manual measurement and continue automatic measurement.

 **Warning**

- ◆ If liquid is spilled on the monitor or accessories, especially when liquid enters the monitor, please stop using the monitor and contact related service personnel.

- ◆ According to the vet situation, oscillometric measurement has some limits. This measurement method requires to find the regular pulse waveform generated by the arterial pressure. The following situations may cause a longer measurement time or unreliable values:
 - Patient moving
 - Arrhythmia
 - Artificial heart-lung machine
 - Quick Pressure Change
 - Severe shock
 - Limited heart rate
 - Extreme large animals

4.4 NIBP Error and Possible Cause of Error

Error	Cause
SysErr	Self-test fail
SysErr2	NIBP module system error
CuffLoose	Cuff is too loose, or cuff not connected
CuffErr	Use small animal cuff under vet mode
Leakage	Valve or gas circuit leak
PressErr	NIBP Valves are not working appropriately
Weak	Patient's pulse is too weak or cuff is loose

OverRange	Patient's blood pressure exceeds the measurement range
Motion	During measurement, motion artefact in signal or too much interference
Protect0	Cuff pressure exceeds the range, Large animals: 300mmHg, Small animals: 150mmHg
Saturate	Too large signal amplitude caused by motion or other reasons
TimeOut	Vet: Cuff pressure over 2kPa(15mmHg)last

	<p>for more than 3minutes</p> <p>Small Animals: Cuff pressure over 0.67kPa (5mmHg) last for more than 90s</p>
Reset	NIBP module reset

4.5 Maintain and Clean

Warning

- Don't press the rubber hose
- Don't let the cleansing liquid enter the vital signs monitor and the charge dock, as it may damage the monitor
- When cleaning the monitor, only wipe the case

Reusable NIBP Cuffs

Sterilise in hot air-drying oven, gas or radiation sterilisation. Remember to remove the rubber hose prior to sterilisation. Cuff can be cleaned by hand-wash or machine-wash (hand-wash can extend service life), but do not dry-clean. Remember to remove the rubber hose prior to cleaning.

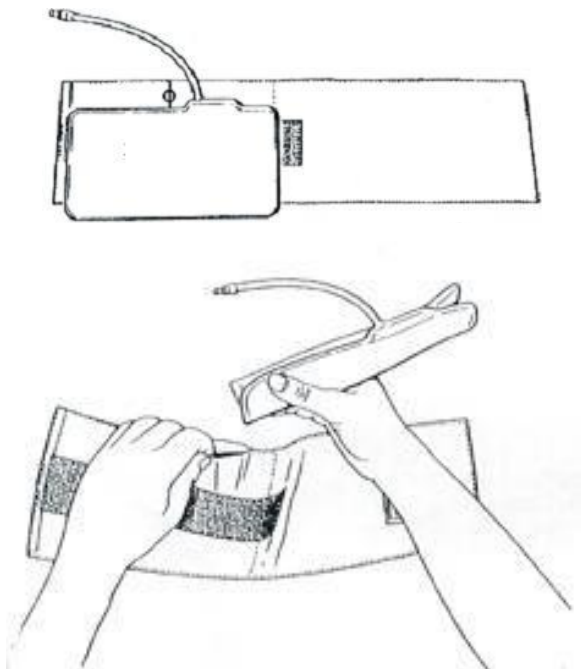


Fig. 4.5.1 Take off the rubber hose from the cuff

Disposable NIBP Cuff

Disposable NIBP cuff can be used for only one patient, it cannot be disinfected or sterilised under high pressure steam.

Chapter V SpO₂ Measurement

5.1 Measurement Parameters

Arterial Oxygen Saturation (SpO₂): Oxyhaemoglobin percentage of total haemoglobin

Pleth Waveform (Pleth): Vet pulse signal Pleth waveform

Pulse Rate: pulse per minute

Index Bar: In proportion to the pulse strength

Blood flow perfusion index: PI values reflect the situation of pulsatile blood flow, which reflect the ability of blood flow perfusion. The larger the pulsation of the blood flow, the higher the PI value.

5.2 Measurement Instruction

Vet SpO₂ Sensor:

- 1) Connect the SpO₂ sensor appropriately
- 2) Press the power button to turn on the monitor

- 3) Put the patient's tongue into the SpO2 sensor appropriately. If this is not practical alternatives are the Lip, Ear, Paw (digits) or Vulva/Prepuce.

5.3 ⚠ Cautions ⚠

- Must use the SpO2 sensor shipped with the monitor
- Keep the SpO2 sensor stable to get accurate measurement results
- When the SpO2 sensor or the patient is moving, the measurement results are not accurate
- Don't put the SpO2 sensor and the NIBP cuff on the same limb.
- Check all the cables and make sure the SpO2 sensor is in good condition
- Don't put the SpO2 sensor on the limb with arteries or veins injection pipe
- Don't use the monitor when the patient's pulse rate is lower than 25 BPM, otherwise, it may give incorrect values

- Don't reuse a disposable SpO2 sensor
- During long term monitoring, check the placement of the probe frequently and ensure there is good contact between the SpO2 sensor and the patient.
- Keep measured skin clean, otherwise it may influence the accuracy of the SpO2 measurement
- Sterilise the SpO2 sensor before measuring different patients. In cases of methaemoglobinemia and carboxyhaemoglobin, the pulse oximeter may not be accurate. Results will also be affected by heavily pigmented skin.

5.4 SpO2 Error and SpO2 Possible Cause of error

Error	Cause
SysErr3	SpO2 module self-test error
SysErr4	SpO2 module communication
no pulse	Can't find pulse

no Sensor	Sp02 sensor not connected
Sensor off	No paw in sensor
Searching	Searching pulse

Chapter VI Temperature Measurement

6.1 Connection Mode

For reusable TEMP probe, plug it into the TEMP probe socket. The TEMP probe can either be placed into the oesophagus (recommended) or be placed rectally.

Maintain and Cleaning

Warning

Turn off the device and disconnect the AC power before cleaning the device or probe.

Reusable TEMP probe

1. Temperature of the probe shall not exceed 100°C (212°F). It can only bear 80°C (176°F) ~100°C (212°F) for a very short period of time.

2. Do not use steam sterilisation.
3. Only use detergent with alcohol sterilisation

6.2 TEMP Error and Possible Cause of error

Error	Cause
SysErr5	TEMP module self-test/communication err
Overrange	Beyond the measurement range

Chapter VII Specifications

7.1 Equipment Classification (IEC 60601-1)

According to the type of protection against electric shock:
Class II (on AC power) internally powered (on battery power)

According to the degree of protection against electric shock: Type BF Applied

Display: 3.5" Colour TFT

Dimensions: 65mm*30mm*145mm

Weight: 250g with rechargeable battery

Working Environment:

Temperature

Operating: 5°C~40°C (41°F~104°F)

Storage/Transportation: -20°C~+55°C

(-4°F~131°F)

Humidity

Operating: 15% ~ 80%

Storage/Transportation: ≤95%

Altitude

700hPa~1060hPa

Power

4V, DC

$P \leq 3.2VA$

NIBP

Measuring Technology: Automatic oscillometric technology

Mode: Manual, Auto, Stat

Measuring Interval in AUTO Mode: 1 ~ 90 (Min)

Measuring Interval in Continuous Mode: 5 (Min)

Pulse Rate Range: 40 ~ 240 (bpm)

Alarm: SYS, DIA, MEAN

Measuring Range:

Large animal Mode

SYS 40 ~270 (mmHg)

MEAN 20 ~230(mmHg)

DIA 10 ~210 (mmHg)

Medium Animal Mode

SYS 40 ~ 200 (mmHg)

MEAN 10 ~ 150 (mmHg)

DIA 20 ~ 165 (mmHg)

Small Animal Mode

SYS 40 ~ 135 (mmHg)

MEAN 20 ~ 105 (mmHg)

DIA 10 ~ 95 (mmHg)

Resolution

Pressure	1mmHg
Maximum Mean Error	±5mmHg
Maximum Standard Deviation	8mmHg
Over-pressure Protection	
Large Animal Mode	290(mmHg)
Medium Animal Mode	240 (mmHg)
Small Animal Mode	145 (mmHg)
Alarm Limit Setting	
SYS	40~280 mmHg
DIA	10~220 mmHg
Measurement Range:	
SpO2:	0~100%
PR:	0-254bpm

Perfusion Index: 0.05%-20%

7.2 Accuracy Range

SpO₂: 70%-100%

PR: 30-254bpm

Perfusion Index: 0.05%-20%

7.3 Measurement Accuracy

SpO₂:

Large/Medium Animal: ± 2 digits (70-100%) undefined
($<70\%$)

Small Animal: ± 3 digits (70-100%) undefined
($<70\%$)

On Motion Condition:

± 3 digits

Pulse Rate:

Large/Medium Animal: ± 3 digits

Small Animal: ± 3 digits

On Motion Condition: ± 3 digits

Alarm Range: 0%~100%

Temperature

Range: 25 - 45°C

(77 – 113°F)

Resolution: 0.1°C

Accuracy: ± 0.1 °C

Power Source

AC power or battery

AC Power

100-240VAC, 50/60Hz, 30VA

Fuse (self-recovery)

Input Fuse: 2A/250V

Fuse (battery): 60Vdc/3A(max)

Battery

Lithium Ion Rechargeable Battery:

3.6V/4.2Ah

Work Time: 8 hours

Charge Time: 6 hours

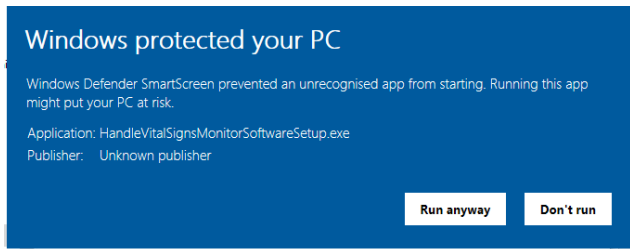
Chapter VIII Instruction of USB Data Upload

8.1 Instructions for USB Data Upload

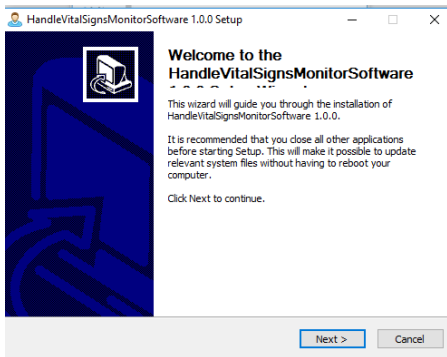
1) Open “HandleVitalSignsMonitorSoftwareSetup”

Name	Date modified	Type	Size
20180718	17/12/2018 11:50	File folder	
20180718	03/12/2018 09:28	RAR File	15,293 KB
HandleVitalSignsMonitorSoftwareSetup	03/12/2018 09:28	Application	15,797 KB

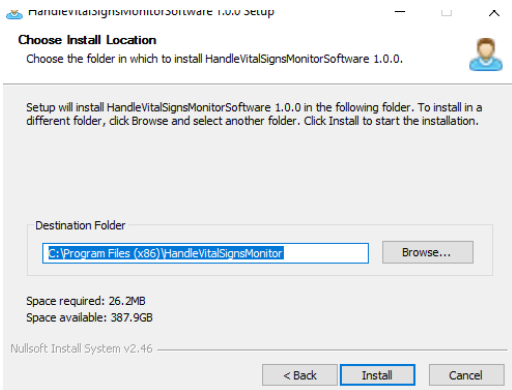
2) Select ‘Run anyway’



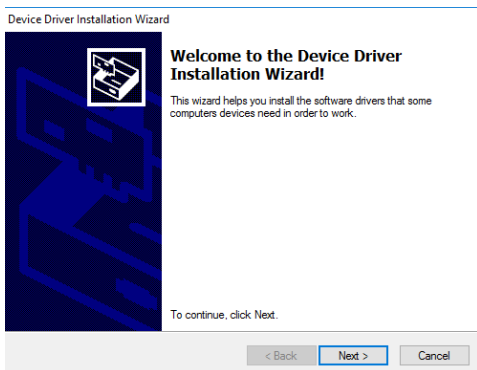
3) Select 'Next'



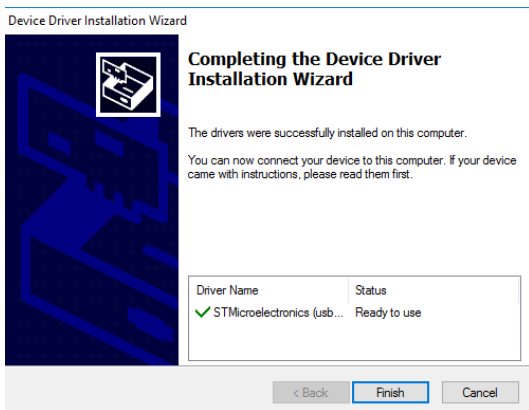
4) Select "Install"



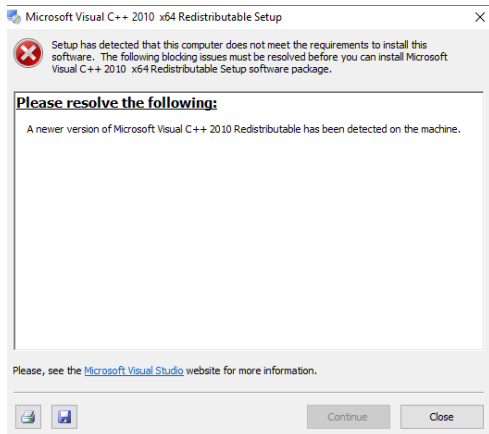
5) Select “Next”



6) Select “Finish”



7) Press “Close”



8) The below icon will appear on your desktop





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