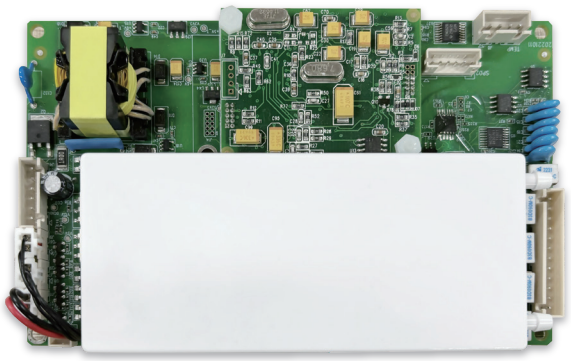
# Multi-parameter
# **Module MMP12**

It is used to monitor the patient's blood oxygen, blood pressure, electrocardiogram, respiration, body temperature, heart rate, and pulse



Dimension： 140mm×85mm×25mm

12 leads ECG | SPO2 | NIBP | HR | RR | PR | 2×TEMP

## Features

- With pulse oxygen and pulse rate monitoring function
- With monitoring function of systolic blood pressure, diastolic blood pressure and mean pressure
- With 12-lead ECG, 3/5-lead ECG, 1 breathing, 2 body temperature monitoring functions
- Provide three patient modes: adult, child and newborn mode
- The module thickness is only 25mm, exquisite and compact
- Design of integrated blood pressure airway system
- The working status of the real-time transmission module: hardware status, software status and sensor status, the upper computer can alarm in time according to the information
- When the perfusion index is as low as 0.075%, the blood oxygen monitoring is accurate and reliable, meeting the application of surgery and ICU
- Both blood oxygen and blood pressure adopt advanced algorithms, with anti-motion interference and weak signal measurement performance
- Blood pressure measurement has three modes: manual, automatic and continuous mode
- Blood pressure measurement has hardware and software dual overvoltage protection functions
- Double timeout protection for blood pressure measurement (module timeout protection, provide timing trigger port of host computer)
- The measurement results of the ECG measurement part include heart rate, body temperature, respiration and ST segment off set values of I, II, and V1 channels
- ECG measurement has diagnosis, monitoring, HARDEST and surgery modes
- ECG diagnostic analysis results include arrhythmia, conduction block, myocardial infarction, STT changes, ventricular hypertrophy, atrial enlargement, electrical axis deviation and other heart diseases

# Specifications

## ECG

| | |
|---|---|
| Range | 0.15Mv-5.5mV |
| Accuracy | Undefined |
| Resolution | 2.36uV/LSB |
| lead type | 3 Lead:I or II or III<br>5Lead:I ,II,III,AVR,AVL,AVF,V1<br>12lead: I ,II,III,AVR,AVL,AVF,V1,V2,V3,V4,V5,V6 |

## RR

| | |
|---|---|
| Range | 0~120rpm |
| Accuracy | 15-120rpm: ±2rpm or ±2%;<br>Undefined(<15rpm) |
| Base resistance | 500-2000Ω |
| Variable resistance | 0.2-3.0Ω |

## HR

| | |
|---|---|
| Range | adult: 15~300bpm<br>Child/Newborn: 15~350bpm |
| Accuracy | ±1bpm |
| Resolution | 1bpm |

## SPO2

| | |
|---|---|
| Range | 0~100% |
| Accuracy | ±2%(70%~100%)Undefined(0~69%) |
| Resolution | 1% |

## NIBP

| | |
|---|---|
| Pressure Range | 0-300mmHg |
| Pressure Accuracy | ±2mmHg or ±1%<br>(Whichever is greater) |
| Resolution | 1mmHg |
| Systolic Range | Adult : 40–270mmHg<br>Pediatric : 40–235mmHg<br>Neonate : 40–130mmHg |
| Distolic Range | Adult : 10–210mmHg<br>Pediatric:10–200mmHg<br>Neonate:10–90mmHg |
| Mean Range | Adult : 20–230mmHg<br>Pediatric : 20–225mmHg<br>Neonate : 20–100mmHg |
| Accuracy | The mean deviation<±5mmHg<br>The standard deviation<8mmHg |

## PR

| | |
|---|---|
| Range | 25~300bpm |
| Accuracy | ±3bpm |
| Resolution | 1bpm |

## PI

| | |
|---|---|
| Range | 0~20% |
| Accuracy | Undefined |
| Resolution | 0.001% |

## TEMP

| | |
|---|---|
| Range | 0-50°C |
| Accuracy | ±0.1°C |
| Resolution | 0.1°C |

## Electical Specification

| | |
|---|---|
| Power supply | DC.12V±5% |
| Power consumption | ≤6W |
| Communication | TTL,USART |
| Temperature | Operating 0°C~ 70°C Storage -40°C~ 70°C |

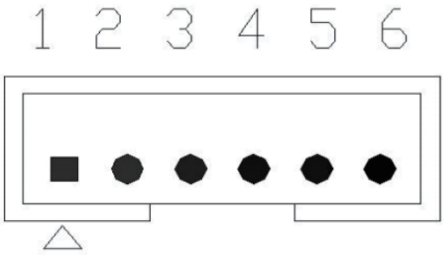
## Compliance

| | | | |
|---|---|---|---|
| Standard | IEC 60601-2-27: 2011 | IEC 80601-2-30: 2018 | DIN EN ISO 81060-1: 2012 |
| | BS EN 1060-3:1997 +A2: 2009 | ISO 80601-2-61: 2017 | AAMI EC57:2012/(R)2020 |

# Interfaces

## Power and Communication Interface

Power and communication interface socket pin definition diagram (Note: 4 and 6 pins are the same input, 3 and 5 pins are the same input)




Note 1: TXD is the data sent by the M103 module to the host.

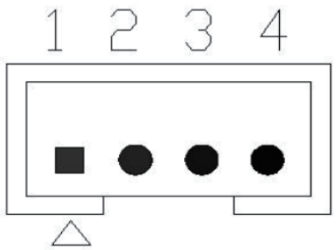
Note 2: J1 socket pin pitch is 2.54mm

Power and communication interface socket J1 pins are defined as follows:

| Pin No | Signal | Description |
|---|---|---|
| 1 | *TXD* | *UART Sending data from module to host* |
| 2 | *RXD* | *UART Receiving data from host to the module* |
| 3 | *DGND* | *12V battery ground* |
| 4 | *+12V* | *Power Supply input 12V DC* |
| 5 | *DGND* | *12V battery ground* |
| 6 | *+12V* | *Power Supply input 12V DC* |

## Body temperature probe interface

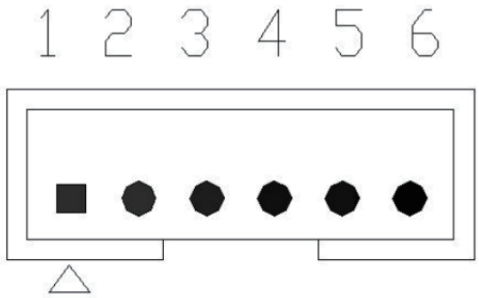
The temperature probe interface J3 is defined as follows, and the socket spacing is 2.54mm:




| Pin No | Signal | Description |
|---|---|---|
| 1 | *TEMP1* | *Temperature sensor 1 positive direction input* |
| 2 | *TGND* | *Temperature sensor 1 negative input* |
| 3 | *TEMP2* | *Temperature sensor 2 positive direction input* |
| 4 | *TGND* | *Temperature sensor 2 negative input* |

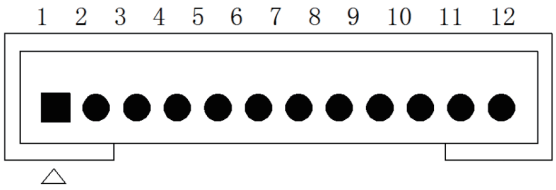
## ECG lead input interface

The 3/5-lead ECG lead input interface J4 is defined as follows, and the socket pin spacing is 2.54mm:

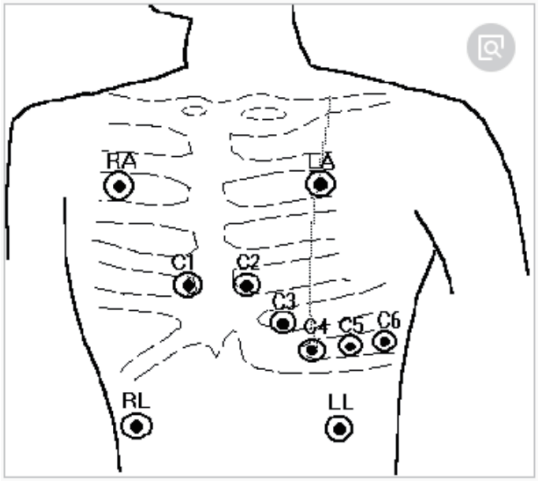



| Pin No | Signal | Description |
|---|---|---|
| 1 | *RL* | *RL(right leg)* |
| 2 | *ECG SHIELD* | *Signal shielding wire* |
| 3 | *V1* | *The chest electrode:4th Intercostal(IC)space at right border of sternum* |
| 4 | *LL* | *LL(left leg)* |
| 5 | *LA* | *LA(left arm)* |
| 6 | *RA* | *RA(right arm)* |

The 12-lead ECG lead input interface J4/J10 is defined as follows, and the socket pin spacing is 2.54mm:



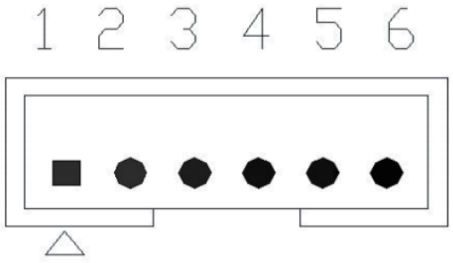

A schematic diagram of the location of the lead electrodes is shown below:




| Pin No | Signal | Description |
|---|---|---|
| 1 | *RL* | *RL(right leg)* |
| 2 | *ECG SHIELD* | *Signal shielding wire* |
| 3 | *V1* | *The chest electrode:4th Intercostal(IC) Space at right border of sternum* |
| 4 | *LL* | *LL(left leg)* |
| 5 | *LA* | *LA(left arm)* |
| 6 | *RA* | *RA(right arm)* |
| 7 | *--* | *Reserved* |
| 8 | *V6* | *Left midaxillary line at the horizontal level of V4* |
| 9 | *V5* | *Left midaxillary line at the horizontal level of V4* |
| 10 | *V4* | *5th IC space on left midclavicular line* |
| 11 | *V3* | *Midway between V2 and V4* |
| 12 | *V2* | *The fourth intercostal space at the left edge of sternum* |

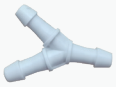
## SpO2 probe interface

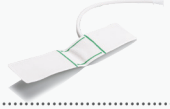
The pin definition of sensor interface socket J7 is as follows, and the socket spacing is 2mm:

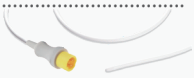



| Pin No | Signal | Description |
|---|---|---|
| 1 | *1_WIRE* | *Probe identification signal line* |
| 2 | *GND* | *power ground* |
| 3 | *IR* | *IR LED positive electrode* |
| 4 | *RED* | *RED LED positive electrode* |
| 5 | *SPO2-* | *Light Signal Negative Electrode* |
| 6 | *SPO2+* | *Light Signal Positive Electrode* |

# Purchase Guider

| Code | Name | Quantity | Description | Image |
|---|---|---|---|---|
| 042-130401-00 | **MMP12 Module** | x 1 | |  |
| 024-030303-03 | **Internal tube for NIBP** | x 1 | Connect with M103 Module and Tee joint |  |
| 023-050103-00 | **Tee joint** | x 1 | Connect with Internal tube |  |
| 022-990101-00 | **Connector board** | x 1 | Connect with M103 Module |  |
| 041-004003-00 | **ECG Cable**<br>10-lead defibrillation proof, European standard, button type | Optional | Connect with ECG interface |  |
| 041-004003-04 | **ECG Cable**<br>10-lead defibrillation proof, American Standard, button type | Optional | Connect with ECG interface |  |
| 041-009004-00 | **SPO2 cable**<br>6-pin SpO2 extension cable,DB9 type | x1 | Connect with connector board SPO2 interface |  |
| 041-002004-01 | **SPO2 probe finger adult**<br>Applicable to adult | Optional | Connect with SPO2 cable |  |
| 041-002005-01 | **SPO2 probe finger child**<br>Applicable to Child | Optional | Connect with SPO2 cable |  |
| 041-002009-00 | **SPO2 probe wrap**<br>Applicable to adult /Pediatric/Infant | Optional | Connect with SPO2 cable |  |
| 041-002027-01 | **SPO2 soft probe finger adult**<br>Applicable to adult | Optional | Connect with SPO2 cable |  |
| 041-002028-01 | **SPO2 soft probe finger child**<br>Applicable to Child | Optional | Connect with SPO2 cable |  |
| 041-002030-00 | **Disposable SPO2 cable**<br>Non-adhesive | Optional | Connect with SPO2 cable |  |
| 041-002006-01 | **Disposable SPO2 cable**<br>Adhesive foam | Optional | Connect with SPO2 cable |  |
| 041-002005-01 | **Disposable SPO2 cable**<br>Adhesion | Optional | Connect with SPO2 cable |  |

| Code | Name | Quantity | Description | Image |
|---|---|---|---|---|
| 041-007002-00 | **NIBP External tube**<br>Reusable NIBP hose | x1 | Connect with<br>pressure sensor and cuff |  |
| 041-001024-01 | **Thigh Cuff**<br>Arm Range : 46-66cm | Optional | Connect with<br>pressure sensor or<br>NIBP external tube |  |
| 041-001025-01 | **Large Adult Cuff**<br>Arm Range : 33-47cm | Optional | Connect with<br>pressure sensor or<br>NIBP external tube |  |
| 041-001026-01 | **Adult Cuff**<br>Arm Range : 25-35cm | Optional | Connect with<br>pressure sensor or<br>NIBP external tube |  |
| 041-001027-01 | **Adult Cuff**<br>Arm Range : 20-28cm | Optional | Connect with<br>pressure sensor or<br>NIBP external tube |  |
| 041-001028-01 | **Child Cuff**<br>Arm Range : 18-26cm | Optional | Connect with<br>pressure sensor or<br>NIBP external tube |  |
| 041-001029-01 | **Infant Cuff**<br>Arm Range : 10-19cm | Optional | Connect with<br>pressure sensor or<br>NIBP external tube |  |
| 041-001032-01 | **Neonate Cuff**<br>Arm Range : 6-11cm | Optional | Connect with<br>pressure sensor or<br>NIBP external tube |  |
| 041-001050-01 | **Neonate 1size (disposable)**<br>Arm Range : 3-6cm | Optional | Connect with<br>pressure sensor or<br>NIBP external tube |  |
| 041-001049-01 | **Neonate 2 size (disposable)**<br>Arm Range : 4-8cm | Optional | Connect with<br>pressure sensor or<br>NIBP external tube |  |
| 041-001048-01 | **Neonate 3 size (disposable)**<br>Arm Range : 6-11cm | Optional | Connect with<br>pressure sensor or<br>NIBP external tube |  |
| 041-001047-01 | **Neonate 4 size (disposable)**<br>Arm Range : 7-13cm | Optional | Connect with<br>pressure sensor or<br>NIBP external tube |  |
| 041-001046-01 | **Neonate 5 size (disposable)**<br>Arm Range : 8-15cm | Optional | Connect with<br>pressure sensor or<br>NIBP external tube |  |
| 041-003005-01 | **Temperature probe Adult Skin** | Optional x 2 | Connect with<br>TEMP interface |  |

| Code | Name | Quantity | Description | Image |
|---|---|---|---|---|
| 041-003003-00 | **Temperature probe Pediatric General** | Optional x 2 | Connect with TEMP interface |  |
| 041-003007-00 | **Temperature probe** Pediatric Skin(Disposable) | Optional x 2 | Connect with TEMP interface |  |
| 041-003006-00 | **Temperature probe** Adult General(Disposable) | Optional x 2 | Connect with TEMP interface |  |
| 041-003008-00 | **Temperature probe** Adult Skin(Disposable) | Optional x 2 | Connect with TEMP interface |  |

* The data is subject to change without notice. Please refer to the manual for the contraindications and precautions

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