UB370 is BDS/GPS/GLONASS Tri-system Hepta-Frequency OEM Board developed by Unicore based on its mature Beidou compatible multi-system GNSS SoC. UB370 provides an ideal solution for a wide range of high precision positioning, navigation, and heading applications.

- **Support of BDS B3 Signal**
  Support BDS/GPS/GLONASS Satellites, and can track and process BDS B1, B2, B3 signals, ensuring more reliable and accurate positioning result.

- **Latest Tri-System & Tri-frequency RTK Engine**
  With the latest tri-frequency RTK engine, UB370 can process tri-frequency of BDS, dual-frequency of GPS and GLONASS observation data. It can significantly reduce initialization time, improve position accuracy, and enhance reliability in difficult environments such as city canyon and canopy, as well as make the long baseline RTK possible.

- **Mature GNSS SoC Technology**
  As the core processor of UB370, more than 100,000 pieces of unicore's high-performance multi-system multi-frequency SoC chip - Nebulas™1 has been applied in the market. The SoC chip is characterized by small size, low power consumption and high reliability.

- **In Accordance with Industry Standard**
  UB370 is fully compatible with the industry standard OEM boards in dimension, electrical feature and protocol for convenience of user development. Besides, multiple communication interfaces provide flexible and fast integration.

- **Web Interface**
  UB370 supports Ethernet interface, user can configure the board through Ethernet. With this, user can manage, upgrade, and reboot the board remotely.

- **Application Programming Interface (API)***
  Open API reduces requirement and complexity of user hardware, make it more flexible and easier for secondary development, and user can customize functions of their own according to special application requirements.

### Application Field

- Surveying
- Navigation and Heading
- Deformation monitoring
- Machine control and Agriculture
- ... 

1 Unicore Nebulas™ (UC260) is multi-system multi-frequency high performance SoC chip, which supports all existing GNSS, including BDS B1/B2/B3, GPS L1/L2/L5, GLONASS L1/L2 and Galileo E1/E5a/E5b.

### Basic Features

- Based on multi-system, multi-frequency, high performance SoC - Nebulas™
- Support single system positioning and multi-system positioning
- Advanced multi-path mitigation technology
- Support various interfaces such as RS232, Ethernet, 1PPS, and External oscillator input etc.
- Support HTTP, FTP, and NTRIP

### Product Characteristics

- Compatible with Industry Standard GNSS OEM boards
- Support BDS B1/B2/B3 + GPS L1/L2 + GLONASS L1/L2
- Centimeter level RTK
- Better than 1mm carrier phase precision
- Better than 0.2° heading accuracy

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# UB370

**BDS/GPS/GLONASS Tri-System Hepta-Frequency High Precision OEM Board**

## Technical Specifications

### Performance Specifications

<table>
<thead>
<tr>
<th>Channel</th>
<th>Frequency</th>
<th>Single Point Position (RMS)</th>
<th>Heading Accuracy (RMS)</th>
<th>RTK(RMS)</th>
<th>Measurement Precision(RMS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on 192-Channel SoC - Nebulas</td>
<td>BDS B1/B2/B3</td>
<td>Horizontal: 1.5m</td>
<td>0.2° (1m baseline)</td>
<td>Horizontal: 1cm + 1ppm</td>
<td>BDS</td>
</tr>
<tr>
<td></td>
<td>GPS L1/L2</td>
<td>Vertical: 3.0m</td>
<td></td>
<td>Vertical: 2cm + 1ppm</td>
<td>GPS</td>
</tr>
<tr>
<td></td>
<td>GLONASS L1/L2</td>
<td></td>
<td></td>
<td></td>
<td>GLONASS</td>
</tr>
</tbody>
</table>

### Initialization time:
- Cold Start: <10s (Typical)
- Warm Start: <10s

### Initialization reliability:
- > 99.9%

### Time to First Fix (TTFF):
- Cold Start: 50s

### Frequency Correction:
- RTCM2.3/3.2 CMR

### Data Output:
- NMEA-0183, Unicore protocol

### Update Rates:
- 20Hz

### Time Accuracy (RMS):
- 20ns

### Velocity Accuracy (RMS):
- 0.03m/s

### Network Protocol:
- NTRIP, HTTP, FTP

### Physical Specifications

<table>
<thead>
<tr>
<th>Dimension</th>
<th>I/O Connectors</th>
<th>Antenna input</th>
<th>External oscillator input</th>
<th>Vibration</th>
<th>Shock</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 x 60 x 11.4 mm</td>
<td>2x12 pin</td>
<td>MMCX</td>
<td>MMCX</td>
<td>GJB150.16-2009, MIL-STD-810</td>
<td>GJB150.18-2009, MIL-STD-810</td>
</tr>
<tr>
<td>Temperature</td>
<td>2x3 pin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-40°C to +85°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-55°C to +95°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature Humidity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>95% non-condensing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Electrical Specifications

<table>
<thead>
<tr>
<th>Voltage</th>
<th>LNA</th>
<th>Ripple Voltage</th>
<th>Power Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3VDC ±5%/–3%</td>
<td>4.75<del>5.10V, 0</del>100 mA</td>
<td>100mV p-p (max)</td>
<td>2.0W (typical)</td>
</tr>
</tbody>
</table>

### Functional Ports

- 1xLAN
- 1x UART (RS-232)
- 2x UART(LV-TTL)
- 1x1PPS (LV-TTL)
- 2 x Events*

**Note:** Part marked with * is customizable.
UB280 is BDS/GPS dual-system dual-antenna board for precise RTK position and heading. The high precision board is developed by Unicore based on its mature BeiDou compatible multi-system GNSS SoC. With low power design and dual-antenna input, UB280 offers millimeter-leveled carrier phase observation value and centimeter-leveled RTK positioning precision, and is in support of multi-path mitigation. Advanced technology of instant and long distant RTK is ideal for high precision positioning, navigation, and heading applications in static and dynamic environments.

- **Rapid RTK Integer Ambiguity Resolution**
  With super strong RTK Algorithms, it insures more rapid initializing speed and can make GNSS-RTK solution on multi-constellation, thus insure users to take the lead in the interoperability era.

- **Instant Heading Technology**
  With innovated RTK algorithm, Unicore has developed the real-time dynamic heading technology on variable baseline length for moving base station. High quality carrier observation and perfect RTK algorithm can provide a 0.2° heading accuracy on a 1 meter baseline.

- **In Support of Web Interface**
  UB280 supports Ethernet interface, user can configure the boards through Ethernet. With this, user can manage, upgrade, and restart the device remotely.

- **In Accordance with the Design Standard of being Small and Classic**
  This board is totally compatible with the main stream OEM boards in dimensions, electrical standards for the convenience of user’s further development. Apart from this, more hardware interfaces are available.

- **Graphical Interface**
  Based on the graphical Control and Display Tool (CDT), the state, SNR and elevating angle of the satellites of all the constellations could be displayed on the screen, thus offers the best convenience to application development.

- **In Support of Application Programming Interface (API)**
  Open API reduces hardware requirements and complexity, making it more flexible and easier for users to make a second development and to customize functions of their own according to their application requirements.

- **Based on multi-system, multi-frequency, high performance SoC - Nebulas™**
- In support of the single system positioning and multi-system positioning
- Advanced technology of multi-path mitigation
- In support of various interfaces such as RS232, USB, Ethernet, 1PPS, and etc.

1. Unicore Nebulas™ (UC260) is multi-system multi-frequency high performance SoC chip, which supports all existing GNSS, including BDS B1/B2/B3, GPS L1/L2/L5, GLONASS L1/L2 and Galileo E1/E5a/E5b.
## UB280
BDS/GPS Dual-System Dual-Antenna
High Precision Heading Board

### Technical Specifications

#### Performance Specifications

<table>
<thead>
<tr>
<th>Channel</th>
<th>Based on 192-Channel SoC - Nebulas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>2x(BDS B1/B2 + GPS L1/L2)</td>
</tr>
<tr>
<td>Single Point</td>
<td>Horizontal : 1.5m</td>
</tr>
<tr>
<td>Position (RMS)</td>
<td>Vertical : 3.0m</td>
</tr>
<tr>
<td>RTK(RMS)</td>
<td>Horizontal : 1cm + 1ppm</td>
</tr>
<tr>
<td></td>
<td>Vertical : 2cm + 1ppm</td>
</tr>
<tr>
<td>Heading Accuracy</td>
<td>0.2° (1m baseline)</td>
</tr>
<tr>
<td>Measurement Precision(RMS)</td>
<td>BDS</td>
</tr>
<tr>
<td></td>
<td>B1/L1 C/A</td>
</tr>
<tr>
<td></td>
<td>B1/L1 Carrier Phase</td>
</tr>
<tr>
<td></td>
<td>B2/L2P(Y)</td>
</tr>
<tr>
<td></td>
<td>B2/L2 Carrier Phase</td>
</tr>
<tr>
<td>Initialization Time</td>
<td>&lt; 10s (Typical)</td>
</tr>
<tr>
<td>Initialization</td>
<td>&gt; 99.9%</td>
</tr>
<tr>
<td>Reliability</td>
<td></td>
</tr>
<tr>
<td>Time to First Fix (TFF)</td>
<td>Cold Start : 50s</td>
</tr>
<tr>
<td>Correction</td>
<td>RTCM 2.3/3.0/3.2, CMR</td>
</tr>
<tr>
<td>Data Output</td>
<td>NMEA-0183, RINEX</td>
</tr>
<tr>
<td>Update Rates*</td>
<td>10Hz</td>
</tr>
<tr>
<td>Time Accuracy (RMS)</td>
<td>20ns</td>
</tr>
<tr>
<td>Velocity Accuracy (RMS)</td>
<td>0.03m/s</td>
</tr>
</tbody>
</table>

#### Physical Specifications

| Dimensions | 100 x 60 x 11.4mm |
| Temperature | Operating : -40°C ~ +85°C |
| | Storage : -55°C ~ +95°C |
| Humidity | 95% non-condensing |
| Vibration | GJB150.16-2009, MIL-STD-810 |
| Shock | GJB150.18-2009, MIL-STD-810 |

#### Electrical Specifications

| Voltage | 3.3V + 5%/-3% |
| Ripple Voltage | 100mV p-p(max) |
| LNA | 4.75 ~ 5.10 V, 100 mA |
| Power | 2.8W (typical) |

#### Functional Ports

| 1 x LAN | |
| 1 x UART(RS-232) | |
| 2 x UART(LV-TTL) | |
| 1×1PPS(LV-TTL) | |
| 2 x Event* | |

Note: Part marked with * is customizable

### CONTACT US

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UR370
BDS/GPS/GLONASS
Tri-system Hepta-frequency
High Precision Receiver

Brief Introduction

UR370 is tri-system hepta-frequency high precision BDS/GPS/GLONASS receiver developed for the application of reference station and post-processing. The Receiver is based on Unicore’s multi-system multi-frequency high performance SoC - (Nebulas™), with low power dissipation design.

- Multi-constellation tracking
  Support BDS/GPS/GLONASS Satellites, and can track and process BDS B1,B2,B3 signals, ensuring more reliable and accurate positioning result.

- Mature GNSS SoC Technology
  As one of UR370’s core processor, by far more than 100,000 pieces of unicore’s high-performance multi-system multi-frequency SoC chip - (Nebulas™), has been applied in the market, The SoC chip is characterized by small size, low power consumption and high reliability.

- In Support of Web Interface
  UR370 supports Ethernet interface, user can configure the Boards through Ethernet. With this, user can manage, upgrade, and restart the device remotely, most suitable for the CORS network application.

- In Support of Multiple Standard Protocol for CORS Applications
  UR370 supports multiple standard application interfaces, such as a network interface, RS232, 1PPS, and an external clock. What’s more, It can support TCP/IP, HTTP, and FTP NTRIP Protocol, available to transmit the raw observation data streaming, real-time differential data streams and observation file of the receiver through network interface.

Application Fields

- Continuous operation reference stations (CORS)
- Geodetic surveying
- Deformation monitoring
- Meteorology monitoring
- Machine control

Product Characteristics

- Support eleven frequency: BDS B1/B2/B3 + GPS L1/L2 + GLONASS L1/L2
- Millimeter-leveled carrier phase observation value
- Specially developed for the application of CORS and post-processing

Basic Features

- Based on multi-system, multi-frequency, high performance SoC - Nebulas™
- Advanced technology of multi-path mitigation
- In support of the single system independent positioning and multi-system interoperation

1 Unicore Nebulas™ (UC260) is multi-system multi-frequency high-performance SoC chip, which supports all existing GNSS, including BDS B1/B2/B3, GPS L1/L2/L5, GLONASS L1/L2 and GALILEO E1/E5a/E5b.
UR370
BDS/GPS/GLONASS
Tri-system Hepta-frequency High Precision Receiver

Technical Specifications

Performance Specifications

<table>
<thead>
<tr>
<th>Channel</th>
<th>192 Channel-Nebulas SoC</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDS B1/B2/B3</td>
<td></td>
</tr>
<tr>
<td>GPS L1/L2</td>
<td></td>
</tr>
<tr>
<td>GLONASS L1/L2</td>
<td></td>
</tr>
<tr>
<td>Single Point Position (RMS)</td>
<td>Horizontal: 1.5m</td>
</tr>
<tr>
<td>Vertical: 3m</td>
<td></td>
</tr>
<tr>
<td>Measurement Precision(RMS)</td>
<td>BDS</td>
</tr>
<tr>
<td>B1/L1 C/A</td>
<td>10cm</td>
</tr>
<tr>
<td>B1/L1 Carrier Phase</td>
<td>1mm</td>
</tr>
<tr>
<td>B2/L2(Y)</td>
<td>10cm</td>
</tr>
<tr>
<td>B2/L2 Carrier Phase</td>
<td>1mm</td>
</tr>
<tr>
<td>B3</td>
<td>10cm</td>
</tr>
<tr>
<td>B3 Carrier Phase</td>
<td>1mm</td>
</tr>
</tbody>
</table>

Time to First Fix (TTFF)
Cold Start: 50s

Correction
RTCM 2 3/3.0/3.2 CMR

Data Output
NMEA-0183 UNICORE

Update Rate
1Hz

Memory
16G

Time Accuracy (RMS)
20ns

Velocity Accuracy (RMS)
0.03m/s

Control Interface
CDT, WEB

Network Protocol
NTRIP, HTTP, FTP

Physical Specifications

Dimensions
265 x 194 x 77 mm

Temperature
Operating: -40°C~+65°C
Storage: -40°C~+85°C

Humidity
95% non-condensing

Power Input

Voltage
12VDC±10%

RF Input/LNA Power Output

Antenna Connector
TNC(F), 50 Ω

Acceptable RF Input Level
-80 dBm ~ -105 dBm

LNA
4.75 ~ 5.10V, 0 ~ 100 mA

Functional Ports

Serial Port
2 x RS-232

Web Interface
1 x RJ45

1PPS
1

External Oscillator Input

Connector
BNC(F), 50 Ω

External Clock Input Frequency
10MHz

Signal Level
0 dBm ~ 10 dBm