**HXSP-2108C Industrial Grade**

**RS-232/RS-485/RS-422 Converter**

**User Manual**

**Product introduction**

HXSP-2108C is an industrial-grade optical isolation multifunctional converter with external power supply, it is compatible with RS-232/RS-485/RS-422 standard. It can change the single-ended RS-232 signal to balanced RS-485/RS-422 signal. The internal optoelectronic isolator and DC Voltage stabilizer can effectively lighten suppression, and the ESD offer 600W Surge Protection for each line; it can avoid the lightning strike and prevent interference effectively. RS-232 interface use the DB9 female connector connect with the serial of computer, on the other side RS-485/RS-422 use the DB9 male connect with 6 terminal board. Since the RS-485 only have two wires to receive data and send data. Handshaking signal (RTS Request To Send) usually control the direction of data sending, the inner circuit of HXSP-2108C converter is able to auto sensing the direction of data flow, and switch to ENABLE CONTROLS automatic. A RS-485 network can be built convenient without any handshaking signal; the RS-485 ENABLE CONTROLS is full transparent, no need to modify any software for the old working method based on RS-232. HXSP-2108C converter comes with external power supply, the characteristic have small in design, long transmission distance, performance stable, etc. It is mainly used for the field of electricity, industrial automatic control, IC card billing system, and so on.

**Specification**

3. Work methods: asynchronous, point to point or multi-point, 2 wire half-duplex.
4. Transmission medium: twisted pair cable or shielded Wire
5. Baud rate: 300~115000bps.
7. Surge Protection: 600W.
8. ESD Protection: 15 KV.
9. Isolation Voltage: 3.5KV Instantaneous, 500V DC continuous
10. Transmission distance: 0~5KM.
11. Dimension: 90mm x 65mm x 25.5mm.

**Pin Definition:**

**RS-232 pin definition**

<table>
<thead>
<tr>
<th>DB9 Female</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-232</td>
<td>DCD</td>
<td>TXD</td>
<td>RXD</td>
<td>DTR</td>
<td>GND</td>
<td>DSR</td>
<td>RTS</td>
<td>CTS</td>
</tr>
</tbody>
</table>

**RS-485/RS-422 pin definition**

<table>
<thead>
<tr>
<th>DB9 Male</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-422</td>
<td>T</td>
<td>T+</td>
<td>R+</td>
<td>R-</td>
<td>GND</td>
<td>+9V</td>
</tr>
<tr>
<td>RS-485</td>
<td>485</td>
<td>485+</td>
<td>GND</td>
<td>+9V</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Application**

Please read the instruction carefully before using HXSP-2108C converter, the 9pin female side of RS-232 cable comes with HXSP-2108C connect to the RS-232 connector of Main Host Computer. And the other side connects to the RS-232 connector of the HXSP-2108C. The power AC Adapter connect to +9V connector. Connect RS-45 or 6 terminal blocks on RS-485/RS-422 as required, when connect all the terminal blocks, it must be according to the Pin Definition. HXSP-2108C converters support 4 kinds of communication method as below:

1. Point to point / four wires full-duplex
2. Point to points / four wires full-duplex
3. Point to point / two wires half-duplex
4. Point to points / two wires half-duplex

The factory settings is auto adaptation status, when the customer use external connection as RS-485 , the HXSP-2108C will be in the half-duplex RS-485 status , and when the customer use external connection as RS-422 , the HXSP-2108C will be in the full-duplex RS-422 status.

1. When the HXSP-2108C connects as RS-232/RS-422, the device connects as RS-422 connection method.

A RS-232/RS-422 communicate as point to point four wire, asynchronous, full-duplex method, this method is mainly used for control-side equipment connector is RS-232, and the connector of equipment under control is RS-422, The two side can not communicate directly because of disaccord of two side electrical specialty, HXSP-2108C converter can be used for transparent change the RS-232 signals to RS-422 signals.
Problem analysis:

1. Data communication unsuccessful
   A. Check RS-232 interfaces whether to be correct;
   B. Check RS-485 interfaces whether to be correct;
   C. Check whether RS-232 signal level (TXD, DTR, RTS) lower than +5V, if that, it can get through power from 6th pin of DB9 Male.

2. Data missing or messy code
   A. Check whether the baud rate and format of both sides of data communication equipment are same.
   B. If possible, add the matched resistance on the terminal circuit (120 Ω, 1/4 w)

Power Supply and Surge Protection

1. HXSP-2108C converter can get the power from the 9V adapter or from other DC power or device. Power supply voltage should be +9V, electric should be 100mA.

2. Surging protection
   Ordinary interface converters do not provide large energy protection equipment, and they try to release the energy to the Earth through the smallest resistance route for the transient high voltage in the interface data line of wire sensor. So it is easy to make the interface component's damage. Interface Converters during the process should avoid grounding vacant in order to ensure the safety of use and reliable communications.