

# S3600

## 4 Channels 3-Wire RTD Module

### User's Manual



**SHJ**  
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**S3600** is a high quality and low cost analog data acquisition module. S3600 has total 4 channels 3-wire RTD input, each input has lightning and surge protection. Output use RS232 or RS485 BUS, both of them has surge protection, to reduce interference by serial port communication, the output isolated by high speed opto-couplers. The modules are slave devices that can be easily controlled via the RS485 serial interface using the industry standard Modbus protocol.

**Highlights:**

- Surge-protected RTD inputs with 16-bit resolution and 100k sample speed
- 3-Wire to avoid resistance affect accuracy
- Different RTD sensor available
- Different temperature range available
- Surge-protected and isolated Rs485 ensure reliability
- Standard ModBus protocol allows for up to 254 unique devices on one RS485 network
- A lot of spare FLASH can be used to store user's parameters
- Can update your firmware via ISP through RS485 network

**Application:**

- ✓ Remote data acquisition
- ✓ Process monitoring
- ✓ Industrial process control
- ✓ Energy management
- ✓ Supervisory control
- ✓ Security systems
- ✓ Laboratory automation
- ✓ Building automation
- ✓ Product testing
- ✓ Direct digital control

**Technical data:**

Resolution-----	16-bit
Input channel number-----	4
Input range-----	Cu50,Cu100,PT100,PT1000
Input protection-----	Lightning,static
Accuracy-----	±0.1%
Zero drift-----	±3uV/°C
Sample rate-----	95 sample/second(8 channels),710 sample/second(1 channel)
Output BUS-----	RS232/RS485
Output Protection-----	Lightning,static
Power input-----	12~24V(AC/DC)
Power consumption-----	<0.6W
Ambient temperature:	
Operation-----	-20~85°C (-13~185°F)

Storage-----	-40~100°C (-40~212°F)
Ambient humidity-----	10%~90%RH
Material,enclosure-----	Flame proof plastic
Enclosure rating-----	IP31
Colour-----	Ice Blue
Size-----	100*69*25 mm

### Wiring diagram and description:



**Wring 1**

#### 1、 Input wiring

C1~C4: see wiring 1

B1~B4: see wiring 1

A1~A4: see wiring 1

#### 2、 Power wiring

DC: 24V, positive end

GND, negative end

AC: 24V, hot line

GND, neutral line

#### 3、 RS485 wiring

RGND: connect to GND for RS485

DATA+:connect to A end of RS485

DATA-: connect to B end of RS485

#### 4、 Reset parameter to default

Put the jumper between GND and INIT ,the following parameters back to default.

- Address of device: 254
- Baudrate:19200
- Filter coefficient:10

#### 5、 LEDs indication

Heart: Flashing when the system is working

Comm:Flashing when serial port communication

**Modbus register list:****Note: \* means default value**

Address	Bytes	Value range		Description	Property																		
		Min	Max																				
0-3	4	1	4294967295	Serial number,unique for each product	R																		
4-5	2	100	65535	Firmware version number	R																		
6	1	1	254	Device address	R/W																		
7	2	3600	3600	Product model	R																		
8	1	1	255	Hardware version	R																		
9	2	12	1152	Baudrate setting <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><th>Value</th><th>Buadrate</th></tr> <tr><td>12</td><td>1200</td></tr> <tr><td>24</td><td>2400</td></tr> <tr><td>48</td><td>4800</td></tr> <tr><td>96</td><td>9600</td></tr> <tr><td>192</td><td>19200</td></tr> <tr><td>384</td><td>38400</td></tr> <tr><td>576</td><td>57600</td></tr> <tr><td>1152</td><td>115200</td></tr> </table> <p>For example:write 96 to register 9 to set the baudrate 9600.</p>	Value	Buadrate	12	1200	24	2400	48	4800	96	9600	192	19200	384	38400	576	57600	1152	115200	R
Value	Buadrate																						
12	1200																						
24	2400																						
48	4800																						
96	9600																						
192	19200																						
384	38400																						
576	57600																						
1152	115200																						
Reserved																							
100-103	2	0	65535	Input1 to input4 analog reading value	R/W																		
104~107	2	0	2	Input 1 to input 4 units setting,0 = raw data,1 = degree c,2 = degree F	R/W																		
108~!11	-	-	-	Reserved	-																		
112~115	-	-	-	Reserved	-																		
116	2	0	65535	Channel 1 calibration point1,ADC sample data	R/W																		
117	2	0	65535	Channel 1 calibration point1,resistor value	R/W																		
118	2	0	65535	Channel 1 calibration point2,ADC sample data	R/W																		
119	2	0	65535	Channel 1 calibration point2,resistor value	R/W																		
120	2	0	65535	Channel 1 calibration point3,ADC sample data	R/W																		
121	2	0	65535	Channel 1 calibration point3,resistor value	R/W																		

Continue...

Address	Bytes	Value range		Description	Property
		Min	Max		
122	2	0	65535	Channel 1 calibration point4,ADC sample data	R/W
123	2	0	65535	Channel 1 calibration point4,resistor value	R/W
124	2	0	65535	Channel 1 calibration point5,ADC sample data	R/W
125	2	0	65535	Channel 1 calibration point5,resistor value	R/W
126	2	0	65535	Channel 1 calibration point6,ADC sample data	R/W
127	2	0	65535	Channel 1 calibration point6,resistor value	R/W
128	2	0	65535	Channel 1 calibration point7,ADC sample data	R/W
129	2	0	65535	Channel 1 calibration point7,resistor value	R/W
130	2	0	65535	Channel 1 calibration point8,ADC sample data	R/W
131	2	0	65535	Channel 1 calibration point8,resistor value	R/W
132	2	0	65535	Channel 1 calibration point9,ADC sample data	R/W
133	2	0	65535	Channel 1 calibration point9,resistor value	R/W
134	2	0	65535	Channel 1 calibration point10,ADC sample data	R/W
135	2	0	65535	Channel 1 calibration point10,resistor value	R/W
136	2	0	65535	Channel 1 calibration point11,ADC sample data	R/W
137	2	0	65535	Channel 1 calibration point11,resistor value	R/W
138	2	0	65535	Channel 1 calibration point12,ADC sample data	R/W
139	2	0	65535	Channel 1 calibration point12,resistor value	R/W
140	2	0	65535	Channel 1 calibration point13,ADC sample data	R/W
141	2	0	65535	Channel 1 calibration point13,resistor value	R/W
142	2	0	65535	Channel 1 calibration point14,ADC sample data	R/W
143	2	0	65535	Channel 1 calibration point14,resistor value	R/W
144	2	0	65535	Channel 1 calibration point15,ADC sample data	R/W
145	2	0	65535	Channel 1 calibration point15,resistor value	R/W
146	2	0	65535	Channel 1 calibration point16,ADC sample data	R/W
147	2	0	65535	Channel 1 calibration point16,resistor value	R/W

Continue...

Address	Bytes	Value range		Description	Property
		Min	Max		
148	2	0	65535	Channel 1 calibration point17,ADC sample data	R/W
149	2	0	65535	Channel 1 calibration point17,resistor value	R/W
150	2	0	65535	Channel 2 calibration point1,ADC sample data	R/W
151	2	0	65535	Channel 2 calibration point1,resistor value	R/W
152	2	0	65535	Channel 2 calibration point2,ADC sample data	R/W
153	2	0	65535	Channel 2 calibration point2,resistor value	R/W
154	2	0	65535	Channel 2 calibration point3,ADC sample data	R/W
155	2	0	65535	Channel 2 calibration point3,resistor value	R/W
156	2	0	65535	Channel 2 calibration point4,ADC sample data	R/W
157	2	0	65535	Channel 2 calibration point4,resistor value	R/W
158	2	0	65535	Channel 2 calibration point5,ADC sample data	R/W
159	2	0	65535	Channel 2 calibration point5,resistor value	R/W
160	2	0	65535	Channel 2 calibration point6,ADC sample data	R/W
161	2	0	65535	Channel 2 calibration point6,resistor value	R/W
162	2	0	65535	Channel 2 calibration point7,ADC sample data	R/W
163	2	0	65535	Channel 2 calibration point7,resistor value	R/W
164	2	0	65535	Channel 2 calibration point8,ADC sample data	R/W
165	2	0	65535	Channel 2 calibration point8,resistor value	R/W
166	2	0	65535	Channel 2 calibration point9,ADC sample data	R/W
167	2	0	65535	Channel 2 calibration point9,resistor value	R/W
168	2	0	65535	Channel 2 calibration point10,ADC sample data	R/W
169	2	0	65535	Channel 2 calibration point10,resistor value	R/W
170	2	0	65535	Channel 2 calibration point11,ADC sample data	R/W
171	2	0	65535	Channel 2 calibration point11,resistor value	R/W
172	2	0	65535	Channel 2 calibration point12,ADC sample data	R/W

173	2	0	65535	Channel 2 calibration point12,resistor value	R/W
174	2	0	65535	Channel 2 calibration point13,ADC sample data	R/W
175	2	0	65535	Channel 2 calibration point13,resistor value	R/W
176	2	0	65535	Channel 2 calibration point14,ADC sample data	R/W
177	2	0	65535	Channel 2 calibration point14,resistor value	R/W
178	2	0	65535	Channel 2 calibration point15,ADC sample data	R/W
179	2	0	65535	Channel 2 calibration point15,resistor value	R/W
180	2	0	65535	Channel 2 calibration point16,ADC sample data	R/W
181	2	0	65535	Channel 2 calibration point16,resistor value	R/W
182	2	0	65535	Channel 2 calibration point17,ADC sample data	R/W
183	2	0	65535	Channel 2 calibration point17,resistor value	R/W
184	2	0	65535	Channel 3 calibration point1,ADC sample data	R/W
185	2	0	65535	Channel 3 calibration point1,resistor value	R/W
186	2	0	65535	Channel 3 calibration point2,ADC sample data	R/W
187	2	0	65535	Channel 3 calibration point2,resistor value	R/W
188	2	0	65535	Channel 3 calibration point3,ADC sample data	R/W
189	2	0	65535	Channel 3 calibration point3,resistor value	R/W
190	2	0	65535	Channel 3 calibration point4,ADC sample data	R/W
191	2	0	65535	Channel 3 calibration point4,resistor value	R/W
192	2	0	65535	Channel 3 calibration point5,ADC sample data	R/W
193	2	0	65535	Channel 3 calibration point5,resistor value	R/W
194	2	0	65535	Channel 3 calibration point6,ADC sample data	R/W
195	2	0	65535	Channel 3 calibration point6,resistor value	R/W
196	2	0	65535	Channel 3 calibration point7,ADC sample data	R/W
197	2	0	65535	Channel 3 calibration point7,resistor value	R/W
198	2	0	65535	Channel 3 calibration point8,ADC sample data	R/W
199	2	0	65535	Channel 3 calibration point8,resistor value	R/W
200	2	0	65535	Channel 3 calibration point9,ADC sample data	R/W
201	2	0	65535	Channel 3 calibration point9,resistor value	R/W
202	2	0	65535	Channel 3 calibration point10,ADC sample data	R/W
203	2	0	65535	Channel 3 calibration point10,resistor value	R/W
204	2	0	65535	Channel 3 calibration point11,ADC sample data	R/W
205	2	0	65535	Channel 3 calibration point11,resistor value	R/W
206	2	0	65535	Channel 3 calibration point12,ADC sample data	R/W
207	2	0	65535	Channel 3 calibration point12,resistor value	R/W
208	2	0	65535	Channel 3 calibration point13,ADC sample data	R/W

209	2	0	65535	Channel 3 calibration point13,resistor value	R/W
210	2	0	65535	Channel 3 calibration point14,ADC sample data	R/W
211	2	0	65535	Channel 3 calibration point14,resistor value	R/W
212	2	0	65535	Channel 3 calibration point15,ADC sample data	R/W
213	2	0	65535	Channel 3 calibration point15,resistor value	R/W
214	2	0	65535	Channel 3 calibration point16,ADC sample data	R/W
215	2	0	65535	Channel 3 calibration point16,resistor value	R/W
216	2	0	65535	Channel 3 calibration point17,ADC sample data	R/W
217	2	0	65535	Channel 3 calibration point17,resistor value	R/W
218	2	0	65535	Channel 4 calibration point1,ADC sample data	R/W
219	2	0	65535	Channel 4 calibration point1,resistor value	R/W
220	2	0	65535	Channel 4 calibration point2,ADC sample data	R/W
221	2	0	65535	Channel 4 calibration point2,resistor value	R/W
222	2	0	65535	Channel 4 calibration point3,ADC sample data	R/W
223	2	0	65535	Channel 4 calibration point3,resistor value	R/W
224	2	0	65535	Channel 4 calibration point4,ADC sample data	R/W
225	2	0	65535	Channel 4 calibration point4,resistor value	R/W
226	2	0	65535	Channel 4 calibration point5,ADC sample data	R/W
227	2	0	65535	Channel 4 calibration point5,resistor value	R/W
228	2	0	65535	Channel 4 calibration point6,ADC sample data	R/W
229	2	0	65535	Channel 4 calibration point6,resistor value	R/W
230	2	0	65535	Channel 4 calibration point7,ADC sample data	R/W
231	2	0	65535	Channel 4 calibration point7,resistor value	R/W
232	2	0	65535	Channel 4 calibration point8,ADC sample data	R/W
233	2	0	65535	Channel 4 calibration point8,resistor value	R/W
234	2	0	65535	Channel 4 calibration point9,ADC sample data	R/W
235	2	0	65535	Channel 4 calibration point9,resistor value	R/W
236	2	0	65535	Channel 4 calibration point10,ADC sample data	R/W
237	2	0	65535	Channel 4 calibration point10,resistor value	R/W
238	2	0	65535	Channel 4 calibration point11,ADC sample data	R/W
239	2	0	65535	Channel 4 calibration point11,resistor value	R/W
240	2	0	65535	Channel 4 calibration point12,ADC sample data	R/W
241	2	0	65535	Channel 4 calibration point12,resistor value	R/W
242	2	0	65535	Channel 4 calibration point13,ADC sample data	R/W
243	2	0	65535	Channel 4 calibration point13,resistor value	R/W
244	2	0	65535	Channel 4 calibration point14,ADC sample data	R/W

245	2	0	65535	Channel 4 calibration point14,resistor value	R/W
246	2	0	65535	Channel 4 calibration point15,ADC sample data	R/W
247	2	0	65535	Channel 4 calibration point15,resistor value	R/W
248	2	0	65535	Channel 4 calibration point16,ADC sample data	R/W
249	2	0	65535	Channel 4 calibration point16,resistor value	R/W
250	2	0	65535	Channel 4 calibration point17,ADC sample data	R/W
251	2	0	65535	Channel 4 calibration point17,resistor value	R/W
252	1	0	2	Write 1 to this register ,channel1 all calibration point will be set to default value	R/W
253	1	0	2	Write 1 to this register ,channel 2 all calibration point will be set to default value	R/W
254	1	0	2	Write 1 to this register ,channel 3 all calibration point will be set to default value	R/W
255	1	0	2	Write 1 to this register ,channel14all calibration point will be set to default value	R/W
256	1	1	255	Respond delay, unit is 2.5ms,default is 2	R/W

**Default Settings:**

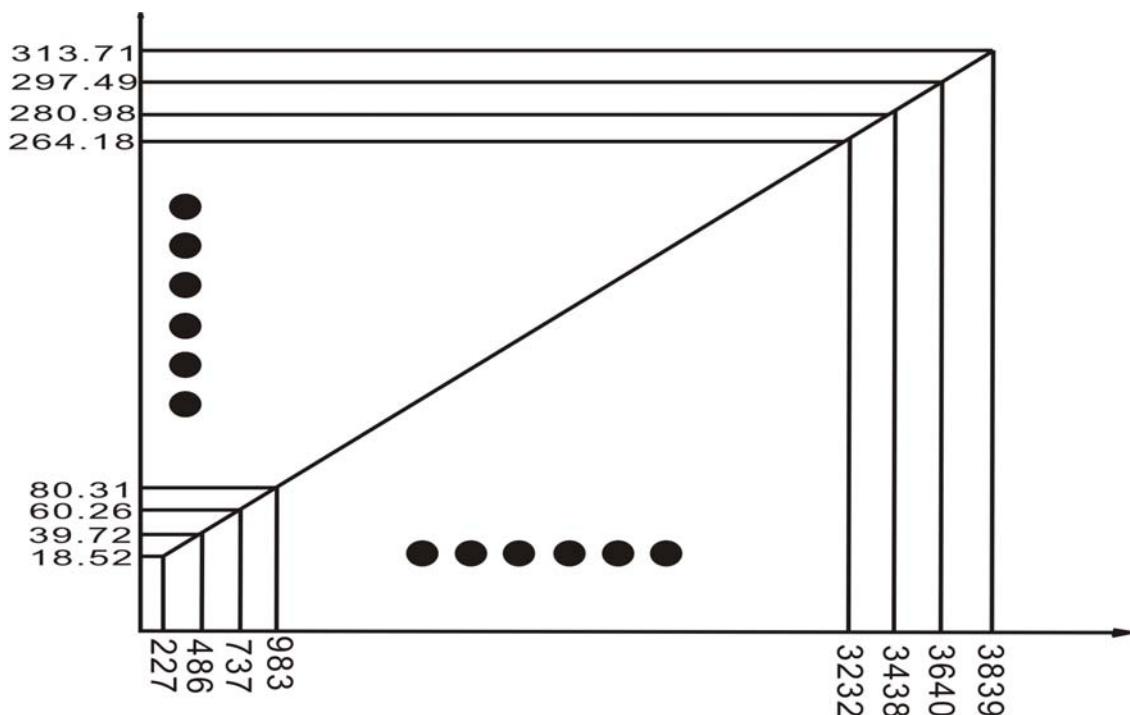
Device ID: 254, 255 is broadcast address

Data Format: 1 start bit, 8 data bit, 1 stop bit, none parity

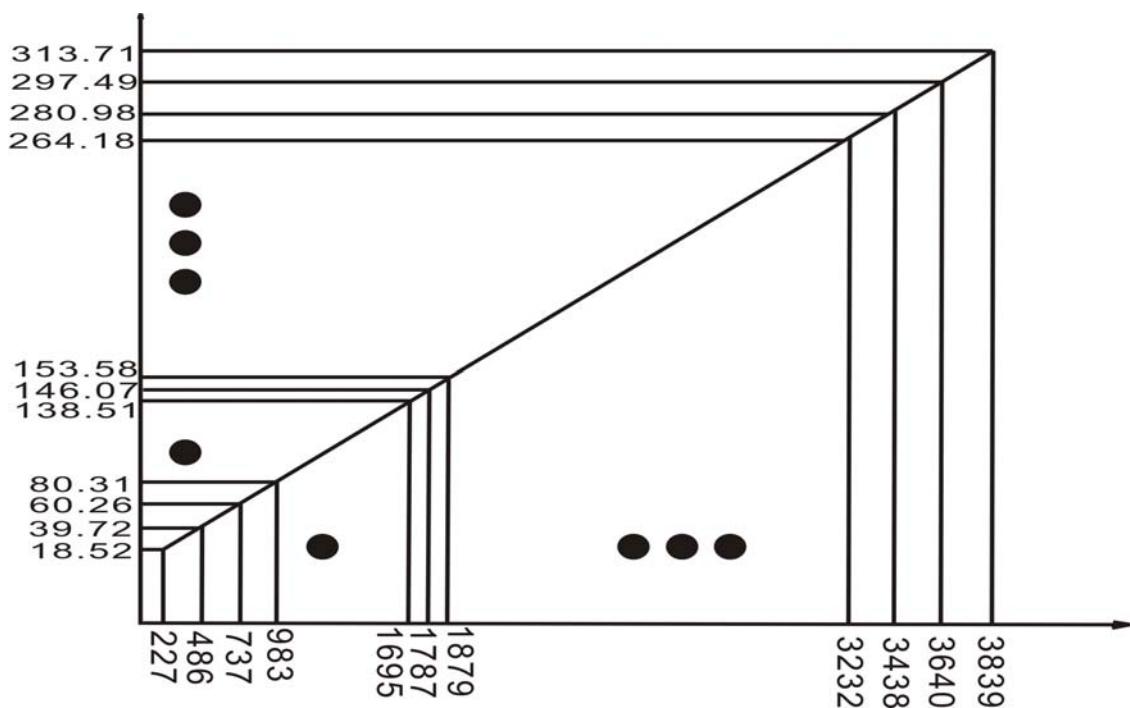
Baudrate: 19200

**Calibration Description:**

S3600 each input has 17 calibration point, from temperature -200 to 600, each 50 degree C one step. The corresponding RTD resistor is from 18.72 to 313.71. Each calibration point include resistor and current ADC raw data. See the following picture.



The calibration point is not fixed at each 50 degree C one step, if you want to get more accurate from 100 to 140 degree C, you can do this. Each 20 degree C one step. Make sure each calibration point must be from low to high.



Or each 10 degree C one step, use this picture. Then you are measure temperature from 0 degree C to 160 degree C.

