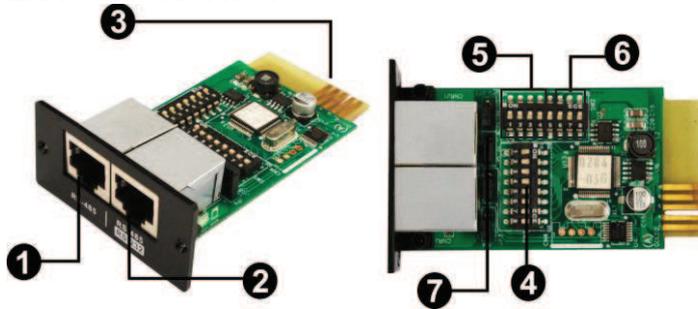


Thank you for purchasing Modbus Card. This manual contains instructions and warnings that should be followed during the installation, operating and storage of the card. Please keep this manual for further reference.

## Special Precautions

- If the card must be stored prior to installation; storage must be in a dry place
- The admissible storage temperature range is from -10°C to +70°C.

## 1. Product Overview



- ① RS-485 port
- ② RS-485/RS-232 port
- ③ Golden finger
- ④ Address switch
- ⑤ Communication setting
- ⑥ Resistance switch
- ⑦ Jumper

## 2. Product Introduction

The Modbus card provides UPS and PV inverter systems with the functionality of communication with PCs through MODBUS protocol:

- Implements MODBUS RTU protocol
- Provides MODBUS functions including read Holding Registers and write Registers.
- Provides RS232 and RS485 interface

### 3. Installation and Operation

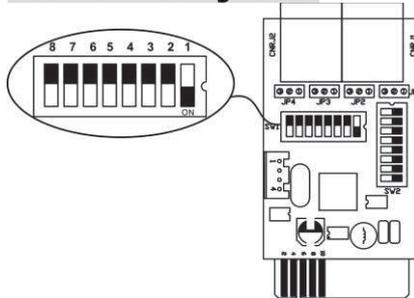
Follow below steps to install and use this modbus card:

1. Configure Modbus ID (Refer section 4 for the details)
2. Configure communication format (Refer section 4 for the details)
3. Configure RS-485 (Refer section 4 for the details)
4. Insert this modbus card into intelligent slot

Connect modbus card to computer with the RS232 or RS485, and it is not necessary to turn the UPS or PV inverter off.

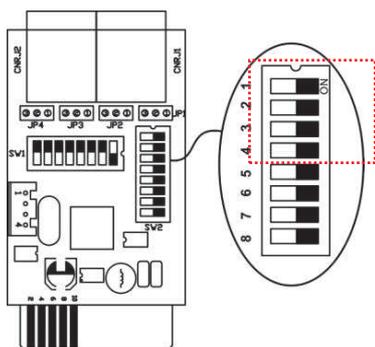
### 4. Configuration

#### Machine ID Configuration



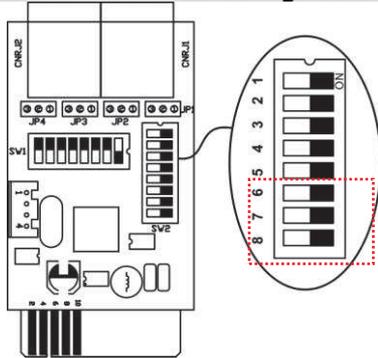
There are eight bits to present ID of each card. Use SW1 to set machine ID. There are eight bits. From left to right, it's 8 to 1. As shown the direction of the card above, when the switch is push down, the bit is set to "one". Otherwise, the bit is set zero. The ID of modbus card is set to 0x01 as above chart.

#### Communication Format Configuration



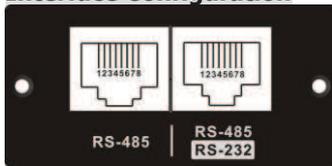
Function	Bit Setting		Meaning
Baud rate	# 1	# 2	
	OFF	OFF	2400bps
	OFF	ON	4800bps
	ON	OFF	9600bps
	ON	ON	19200bps(default)
Parity check	# 4	# 3	
	OFF	OFF	Even parity
	OFF	ON	Odd parity
	ON	OFF	No parity check 1 stop bits
	ON	ON	No parity check 2 stop bits(default)

## RS-485 Resistance Configuration



Function	Bit #	Setting	Meaning
Push up resistance	# 6	ON	Enable (Default)
		OFF	Disable
Push down resistance	# 7	ON	Enable (Default)
		OFF	Disable
Terminate resistance	# 8	ON	Enable (Default)
		OFF	Disable

## Interface Configuration



RS-485 /RS-232 Pin Configuration

Pin	Function
1	TXD – transfer data to PC
2	RXD – receive data from PC
4	RS-485 - B
5	RS-485 - A
8	GND

RS-485 Pin Configuration

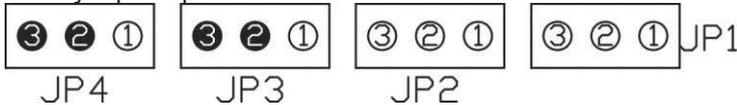
Pin	Function
4	RS-485 - B
5	RS-485 - A
8	GND

## Jumper Setting and Connection

### RS-232 & RS-485 Function setting

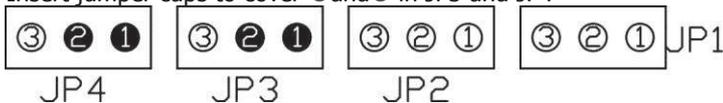
Select RS-485(Default setting)

Insert jumper caps to cover ② and ③ in JP3 and JP4



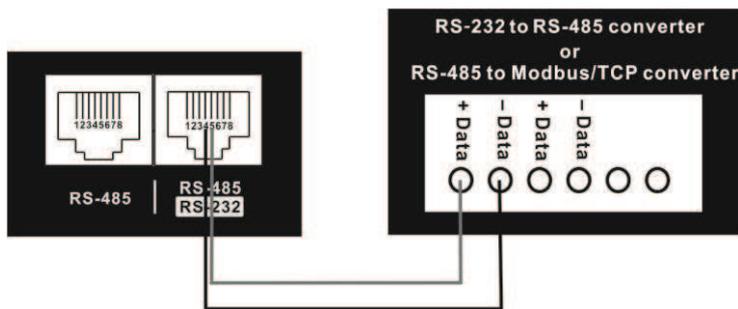
Select RS-232

Insert jumper caps to cover ① and ② in JP3 and JP4



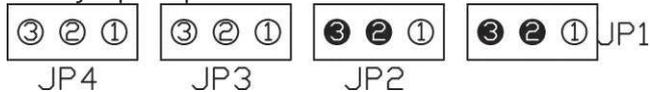
## Mode setting

You may select serial or parallel connection to monitor devices with Modbus cards. Before completing this connection, you may use one RS-232 to RS-485 converter or RS-485 to Modbus/TCP converter to connect to PC. Please follow below wiring connection:



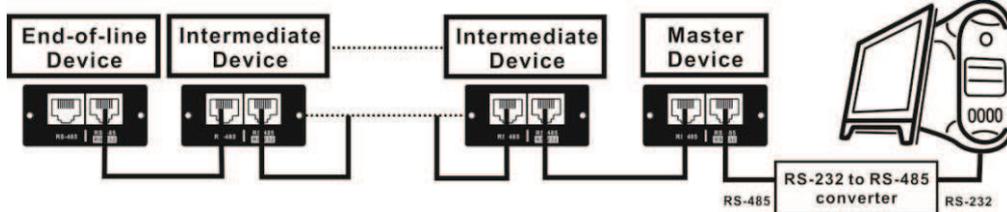
### 1. Serial connection (Default setting)

Insert jumper caps to cover ② and ③ in JP1 and JP2 as shown below:

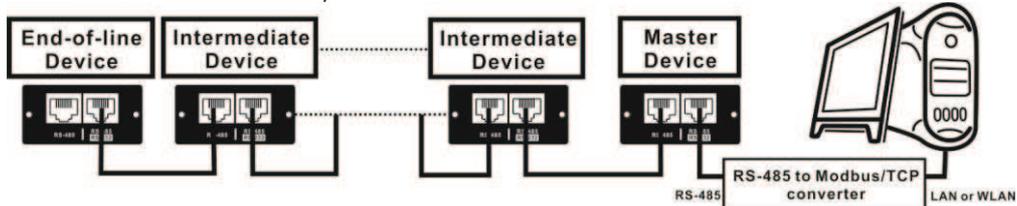


Then, follow below diagram to connect:

- With RS-232 to RS-485 converter

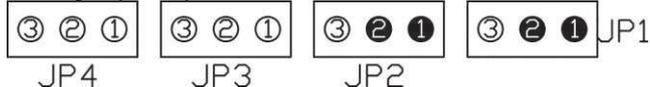


- With RS-485 to Modbus/TCP converter



### 2. Parallel Connection

Insert jumper caps to cover ① and ② in JP1 and JP2 as shown below:

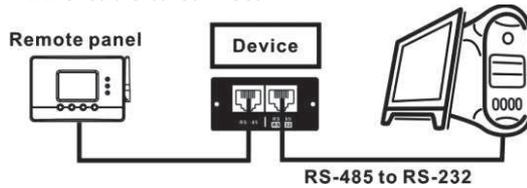


# Modbus Card Quick Guide

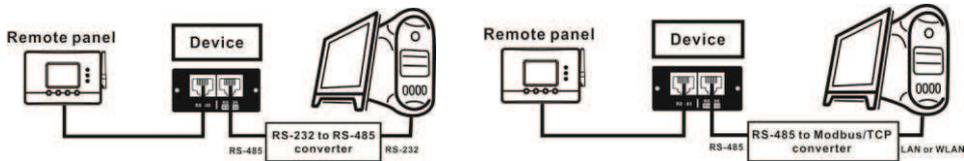
V.2.0

Then, follow below diagram to connect:

1. If only one device connects to a PC and a remote panel at the same time.
  - When the distance between PC and Modbus card is less than 1.5 M, simply use RJ-45 to DB-9 cable to connect.



- When the distance between PC and Modbus card is larger than 1.5 M, please use one RS-232 to RS-485 converter or RS-485 to Modbus/TCP converter to connect. Refer to below connection.

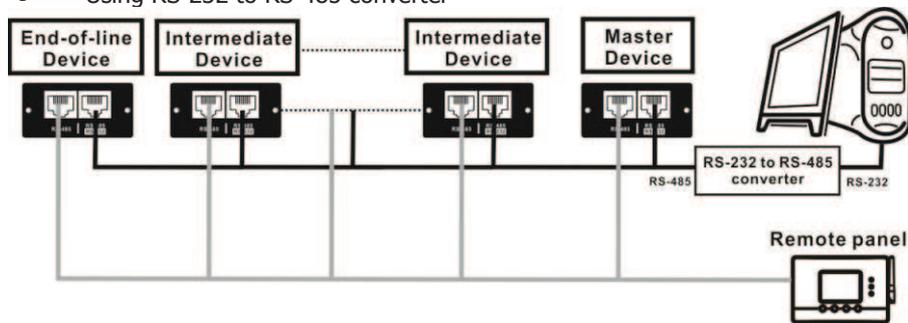


Using RS-232 to RS-485 converter

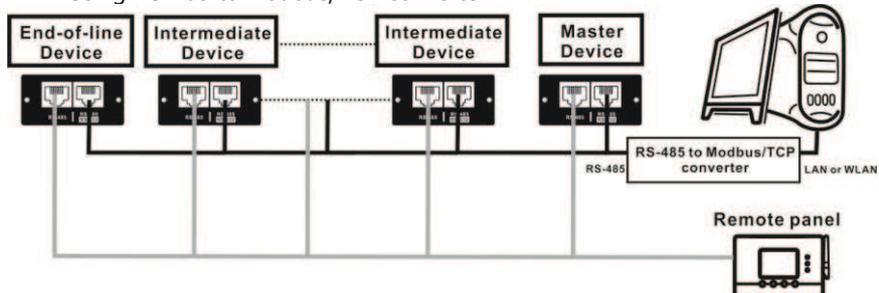
Use RS-485 to Modbus/TCP converter

2. If multiple devices connects to a PC and a remote panel at the same time.

- Using RS-232 to RS-485 converter



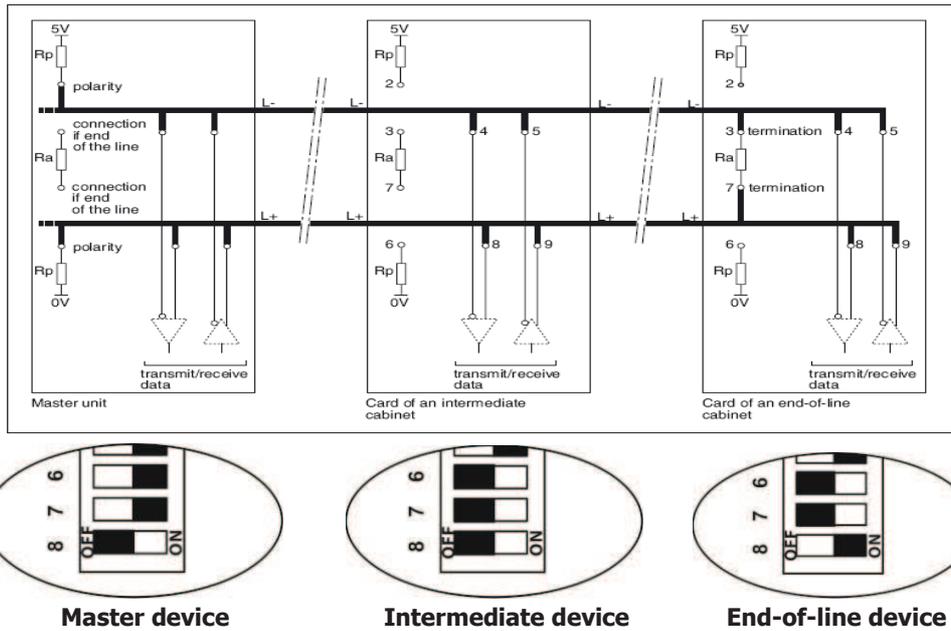
- Using RS-485 to Modbus/TCP converter



## 5. Multiple Monitoring

One modbus card only can be used in one UPS at the same time. When each UPS installed with one modbus card, all UPSs can be monitored from one computer.

Topology and RS-485 resistance configuration refers to the following figure:



### APPENDIX: Machine ID Configuration Table (SW1) √=ON x=OFF

ID \ SW1	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
1	√	x	x	x	x	x	x	x
2	x	√	x	x	x	x	x	x
3	√	√	x	x	x	x	x	x
4	x	x	√	x	x	x	x	x
5	√	x	√	x	x	x	x	x
6	x	√	√	x	x	x	x	x
7	√	√	√	x	x	x	x	x
8	x	x	x	√	x	x	x	x
9	√	x	x	√	x	x	x	x
10	x	√	x	√	x	x	x	x
11	√	√	x	√	x	x	x	x
12	x	x	√	√	x	x	x	x
13	√	x	√	√	x	x	x	x

# Modbus Card Quick Guide

V.2.0

SW1 ID	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
14	x	√	√	√	x	x	x	x
15	√	√	√	√	x	x	x	x
16	x	x	x	x	√	x	x	x
17	√	x	x	x	√	x	x	x
18	x	√	x	x	√	x	x	x
19	√	√	x	x	√	x	x	x
20	x	x	√	x	√	x	x	x
21	√	x	√	x	√	x	x	x
22	x	√	√	x	√	x	x	x
23	√	√	√	x	√	x	x	x
24	x	x	x	√	√	x	x	x
25	√	x	x	√	√	x	x	x
26	x	√	x	√	√	x	x	x
27	√	√	x	√	√	x	x	x
28	x	x	√	√	√	x	x	x
29	√	x	√	√	√	x	x	x
30	x	√	√	√	√	x	x	x
31	√	√	√	√	√	x	x	x
32	x	x	x	x	x	√	x	x
33	√	x	x	x	x	√	x	x
34	x	√	x	x	x	√	x	x
35	√	√	x	x	x	√	x	x
36	x	x	√	x	x	√	x	x
37	√	x	√	x	x	√	x	x
38	x	√	√	x	x	√	x	x
39	√	√	√	x	x	√	x	x
40	x	x	x	√	x	√	x	x
41	√	x	x	√	x	√	x	x
42	x	√	x	√	x	√	x	x
43	√	√	x	√	x	√	x	x
44	x	x	√	√	x	√	x	x
45	√	x	√	√	x	√	x	x
46	x	√	√	√	x	√	x	x
47	√	√	√	√	x	√	x	x
48	x	x	x	x	√	√	x	x
49	√	x	x	x	√	√	x	x
50	x	√	x	x	√	√	x	x
51	√	√	x	x	√	√	x	x
52	x	x	√	x	√	√	x	x

# Modbus Card Quick Guide

V.2.0

SW1 ID	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
53	√	x	√	x	√	√	x	x
54	x	√	√	x	√	√	x	x
55	√	√	√	x	√	√	x	x
56	x	x	x	√	√	√	x	x
57	√	x	x	√	√	√	x	x
58	x	√	x	√	√	√	x	x
59	√	√	x	√	√	√	x	x
60	x	x	√	√	√	√	x	x
61	√	x	√	√	√	√	x	x
62	x	√	√	√	√	√	x	x
63	√	√	√	√	√	√	x	x
64	x	x	x	x	x	x	√	x
65	√	x	x	x	x	x	√	x
66	x	√	x	x	x	x	√	x
67	√	√	x	x	x	x	√	x
68	x	x	√	x	x	x	√	x
69	√	x	√	x	x	x	√	x
70	x	√	√	x	x	x	√	x
71	√	√	√	x	x	x	√	x
72	x	x	x	√	x	x	√	x
73	√	x	x	√	x	x	√	x
74	x	√	x	√	x	x	√	x
75	√	√	x	√	x	x	√	x
76	x	x	√	√	x	x	√	x
77	√	x	√	√	x	x	√	x
78	x	√	√	√	x	x	√	x
79	√	√	√	√	x	x	√	x
80	x	x	x	x	√	x	√	x
81	√	x	x	x	√	x	√	x
82	x	√	x	x	√	x	√	x
83	√	√	x	x	√	x	√	x
84	x	x	√	x	√	x	√	x
85	√	x	√	x	√	x	√	x
86	x	√	√	x	√	x	√	x
87	√	√	√	x	√	x	√	x
88	x	x	x	√	√	x	√	x
89	√	x	x	√	√	x	√	x
90	x	√	x	√	√	x	√	x
91	√	√	x	√	√	x	√	x

# Modbus Card Quick Guide

V.2.0

SW1 ID	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
92	x	x	√	√	√	x	√	x
93	√	x	√	√	√	x	√	x
94	x	√	√	√	√	x	√	x
95	√	√	√	√	√	x	√	x
96	x	x	x	x	x	√	√	x
97	√	x	x	x	x	√	√	x
98	x	√	x	x	x	√	√	x
99	√	√	x	x	x	√	√	x
100	x	x	√	x	x	√	√	x
101	√	x	√	x	x	√	√	x
102	x	√	√	x	x	√	√	x
103	√	√	√	x	x	√	√	x
104	x	x	x	√	x	√	√	x
105	√	x	x	√	x	√	√	x
106	x	√	x	√	x	√	√	x
107	√	√	x	√	x	√	√	x
108	x	x	√	√	x	√	√	x
109	√	x	√	√	x	√	√	x
110	x	√	√	√	x	√	√	x
111	√	√	√	√	x	√	√	x
112	x	x	x	x	√	√	√	x
113	√	x	x	x	√	√	√	x
114	x	√	x	x	√	√	√	x
115	√	√	x	x	√	√	√	x
116	x	x	√	x	√	√	√	x
117	√	x	√	x	√	√	√	x
118	x	√	√	x	√	√	√	x
119	√	√	√	x	√	√	√	x
120	x	x	x	√	√	√	√	x
121	√	x	x	√	√	√	√	x
122	x	√	x	√	√	√	√	x
123	√	√	x	√	√	√	√	x
124	x	x	√	√	√	√	√	x
125	√	x	√	√	√	√	√	x
126	x	√	√	√	√	√	√	x
127	√	√	√	√	√	√	√	x
128	x	x	x	x	x	x	x	√
129	√	x	x	x	x	x	x	√
130	x	√	x	x	x	x	x	√

# Modbus Card Quick Guide

V.2.0

SW1 ID	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
131	√	√	x	x	x	x	x	√
132	x	x	√	x	x	x	x	√
133	√	x	√	x	x	x	x	√
134	x	√	√	x	x	x	x	√
135	√	√	√	x	x	x	x	√
135	x	x	x	√	x	x	x	√
137	√	x	x	√	x	x	x	√
138	x	√	x	√	x	x	x	√
139	√	√	x	√	x	x	x	√
140	x	x	√	√	x	x	x	√
141	√	x	√	√	x	x	x	√
142	x	√	√	√	x	x	x	√
143	√	√	√	√	x	x	x	√
144	x	x	x	x	√	x	x	√
145	√	x	x	x	√	x	x	√
146	x	√	x	x	√	x	x	√
147	√	√	x	x	√	x	x	√
148	x	x	√	x	√	x	x	√
149	√	x	√	x	√	x	x	√
150	x	√	√	x	√	x	x	√
151	√	√	√	x	√	x	x	√
152	x	x	x	√	√	x	x	√
153	√	x	x	√	√	x	x	√
154	x	√	x	√	√	x	x	√
155	√	√	x	√	√	x	x	√
156	x	x	√	√	√	x	x	√
157	√	x	√	√	√	x	x	√
158	x	√	√	√	√	x	x	√
159	√	√	√	√	√	x	x	√
160	x	x	x	x	x	√	x	√
161	√	x	x	x	x	√	x	√
162	x	√	x	x	x	√	x	√
163	√	√	x	x	x	√	x	√
164	x	x	√	x	x	√	x	√
164	√	x	√	x	x	√	x	√
166	x	√	√	x	x	√	x	√
167	√	√	√	x	x	√	x	√
168	x	x	x	√	x	√	x	√
169	√	x	x	√	x	√	x	√

# Modbus Card Quick Guide

V.2.0

SW1 ID	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
170	x	√	x	√	x	√	x	√
171	√	√	x	√	x	√	x	√
172	x	x	√	√	x	√	x	√
173	√	x	√	√	x	√	x	√
174	x	√	√	√	x	√	x	√
175	√	√	√	√	x	√	x	√
176	x	x	x	x	√	√	x	√
177	√	x	x	x	√	√	x	√
177	x	√	x	x	√	√	x	√
179	√	√	x	x	√	√	x	√
180	x	x	√	x	√	√	x	√
181	√	x	√	x	√	√	x	√
182	x	√	√	x	√	√	x	√
183	√	√	√	x	√	√	x	√
184	x	x	x	√	√	√	x	√
185	√	x	x	√	√	√	x	√
186	x	√	x	√	√	√	x	√
187	√	√	x	√	√	√	x	√
188	x	x	√	√	√	√	x	√
189	√	x	√	√	√	√	x	√
190	x	√	√	√	√	√	x	√
191	√	√	√	√	√	√	x	√
192	x	x	x	x	x	x	√	√
193	√	x	x	x	x	x	√	√
194	x	√	x	x	x	x	√	√
195	√	√	x	x	x	x	√	√
196	x	x	√	x	x	x	√	√
197	√	x	√	x	x	x	√	√
198	x	√	√	x	x	x	√	√
199	√	√	√	x	x	x	√	√
200	x	x	x	√	x	x	√	√
201	√	x	x	√	x	x	√	√
202	x	√	x	√	x	x	√	√
203	√	√	x	√	x	x	√	√
204	x	x	√	√	x	x	√	√
205	√	x	√	√	x	x	√	√
206	x	√	√	√	x	x	√	√
207	√	√	√	√	x	x	√	√
208	x	x	x	x	√	x	√	√

# Modbus Card Quick Guide

V.2.0

SW1 ID	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
209	√	x	x	x	√	x	√	√
210	x	√	x	x	√	x	√	√
211	√	√	x	x	√	x	√	√
212	x	x	√	x	√	x	√	√
213	√	x	√	x	√	x	√	√
214	x	√	√	x	√	x	√	√
215	√	√	√	x	√	x	√	√
216	x	x	x	√	√	x	√	√
217	√	x	x	√	√	x	√	√
218	x	√	x	√	√	x	√	√
219	√	√	x	√	√	x	√	√
220	x	x	√	√	√	x	√	√
221	√	x	√	√	√	x	√	√
222	x	√	√	√	√	x	√	√
223	√	√	√	√	√	x	√	√
224	x	x	x	x	x	√	√	√
225	√	x	x	x	x	√	√	√
226	x	√	x	x	x	√	√	√
227	√	√	x	x	x	√	√	√
228	x	x	√	x	x	√	√	√
229	√	x	√	x	x	√	√	√
230	x	√	√	x	x	√	√	√
231	√	√	√	x	x	√	√	√
232	x	x	x	√	x	√	√	√
233	√	x	x	√	x	√	√	√
234	x	√	x	√	x	√	√	√
235	√	√	x	√	x	√	√	√
236	x	x	√	√	x	√	√	√
237	√	x	√	√	x	√	√	√
238	x	√	√	√	x	√	√	√
239	√	√	√	√	x	√	√	√
240	x	x	x	x	√	√	√	√
241	√	x	x	x	√	√	√	√
242	x	√	x	x	√	√	√	√
243	√	√	x	x	√	√	√	√
244	x	x	√	x	√	√	√	√
245	√	x	√	x	√	√	√	√
246	x	√	√	x	√	√	√	√
247	√	√	√	x	√	√	√	√