RONAN

X11CA-IM
MASTER MODULE

(Firmware: X11-MF3 Rev. 3)

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1 OVERVIEW

The X11CA-IM Interface Module monitors alarm module activities. It also provides special features, such as Slave Modbus RTU Protocol on Port (P2), time stamped event archive, common trouble alarm, dual horn output, reflash output and system diagnostic output. All outputs are generated in the form of an open collector transistor and selectable Form C dry contact. The LEDs on the board indicate serial communication and system status.

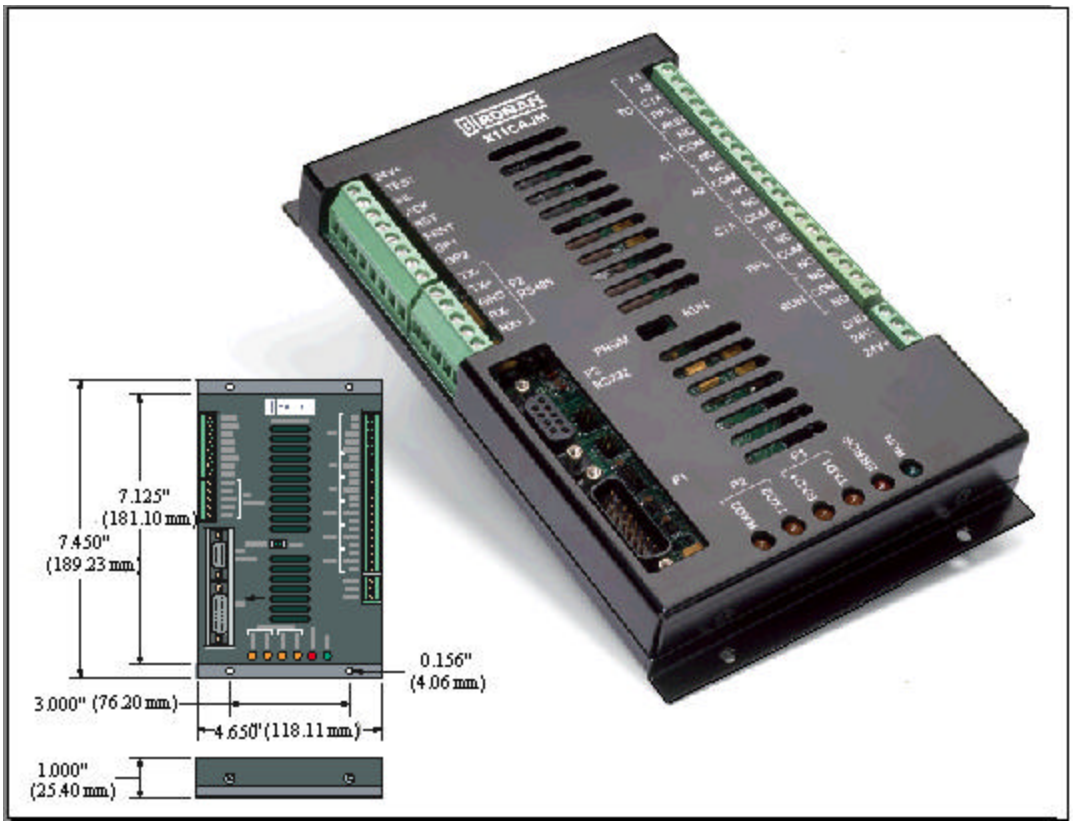

Figure 1-1 X11CA-IM

1.1 Definitions

RS-232 A point-to-point serial connection standard. The RS-232 standard was designed for communication over short distances (up to 50 feet).

1.2 Revision History

Revision 1.0 ECO11217 : Page 1, Definition Section, RS-232 was revised to remove the line, 'and at relatively slow data rates, (up to 20 kbps). However, in practice, these limits can be exceeded'

Revision 2.0 ECO11939 FIRMWARE was upgraded to Version 3 Added MODBUS function 3& 5

1.3 Reference Documents

QA400	Design Control
QA4000	Design Development Quality Assurance Plan
QA4500	Project Archive

X11CA-3001-IOM X11CA Configuration Software User's Manual

2 X11-MF3 FIRMWARE

The firmware on the X11CA-IM scans each X11CA alarm module for the following information.

Field contacts (A, B, C, D),
H1 (Horn1), H2 (Horn2) and CTA (Common Trouble Alarm),
Operation mode for each channel (IA, IB, IC, ID),
First Out indication for each channel (FA, FB, FC, FD)

The scanned information is then stored into the holding registers, starting at the address 00, in two byte format as shown below.

Hi byte	FD	FC	FB	FA	ID	IC	IB	IA
Low byte	S	H2	H1	CTA	D	C	B	A

The following list has the descriptions of each data bit.

	Descriptions
A	Status of the first input
B	Status of the second input
C	Status of the third input
D	Status of the forth input
CTA	Status of Common Trouble Alarm
H1	Status of the Horn1
H2	Status of the Horn2
S	Communication status bit: 0=Successful, 1=Failed to communicate with X11CA Alarm modules.

IA	Operation mode of Channel A. If IA=0, CH A is Contact Input. If IA=1, CH A is serial input.
IB	Operation mode of Channel B. If IB=0, CH B is Contact Input. If IB=1, CH B is serial input.
IC	Operation mode of Channel C. If IC=0, CH C is Contact Input. If IC=1, CH C is serial input.
ID	Operation mode of Channel D. If ID=0, CH D is Contact Input. If ID=1, CH D is serial input.
FA	If FA=1, CH A is the First Out channel within the group.
FB	If FB=1, CH B is the First Out channel within the group.
FC	If FC=1, CH C is the First Out channel within the group.
FD	If FD=1, CH D is the First Out channel within the group.

Table 2-1 Descriptions of Modbus Communication Data Format

3 CABLES

The Port 2 is communication port to host device and can be either RS232 or isolated RS485.

? The RS485 connection is a 5 pin screw terminal and the pin assignments are marked on the cover.
? The RS232 connection is the 9 pin female connector and the pin assignments are listed below.

3.1.1 RS232: Laptop to X11CA-IM(P2)

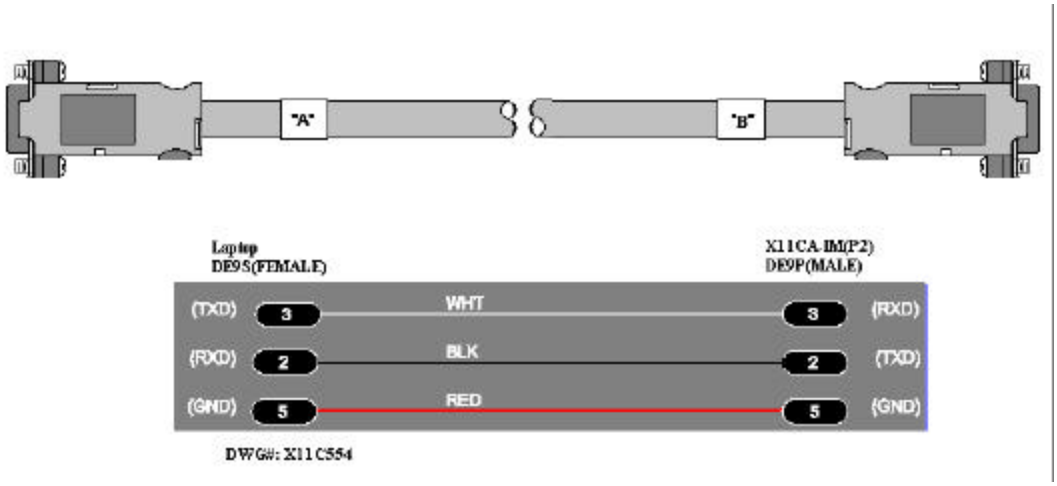

Figure 3-1 RS232 Cable from the Laptop to X11CA-IM Connection

3.1.2 RS232: PC to X11CA-IM(P2)

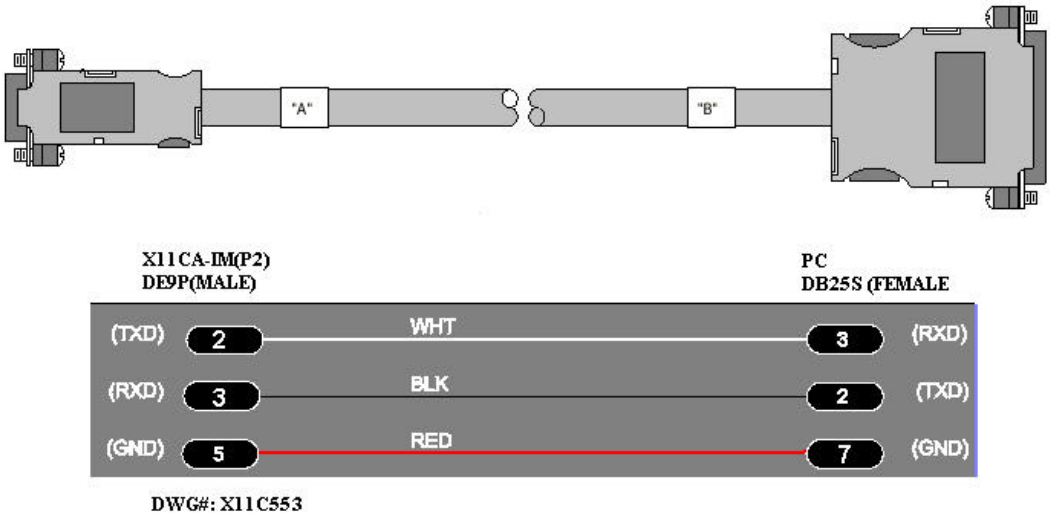

Figure 3-2 RS232 Cable from the Laptop to X11CA-IM Connection

4 MODBUS COMMUNICATION PROTOCOL

4.1 Slave Address Setting

The Slave Address switch (SW1 or SW3, depending on the revision of the PCB) on the X11CA-IM Module sets the Slave Address of the X11CA-IM Master Module for MODBUS RTU communication as shown below.

Slave address	SW1-1	SW1-2	SW1-3	SW1-4
1	OFF	OFF	OFF	OFF
2	**ON**	OFF	OFF	OFF
3	OFF	**ON**	OFF	OFF
4	**ON**	**ON**	OFF	OFF
5	OFF	OFF	**ON**	OFF
6	**ON**	OFF	**ON**	OFF
7	OFF	**ON**	**ON**	OFF
8	**ON**	**ON**	**ON**	OFF
9	OFF	OFF	OFF	**ON**
10	**ON**	OFF	OFF	**ON**
11	OFF	**ON**	OFF	**ON**
12	**ON**	**ON**	OFF	**ON**
13	OFF	OFF	**ON**	**ON**
14	**ON**	OFF	**ON**	**ON**
15	OFF	**ON**	**ON**	**ON**
16	**ON**	**ON**	**ON**	**ON**

Table 4-1 Setting Modbus Slave Address

4.2 Data Communication Format

The data format for Modbus communication is 19200, no parity, 8 bit and 1 stop bit.

4.3 Modbus RTU Protocol Function 3: Read the Holding Registers

To read the binary contents of the holding registers on the X11CA-IM from a host device, use Modbus RTU Protocol function 3.

Query

The query message specifies the starting register and the quantity of registers to be read. Registers are addressed starting at zero: registers 1-16 are addressed as 0-15.

EXAMPLE:
The following example reads registers 40108-40110 from the slave device 17.

$11_{HEX} = 10001_{BIN} = 17_{DEC}$
$6B_{HEX} = 1101011_{BIN} = 107_{DEC}$

Field Name	Example (Hex)
Slave Address	11
Function	03
Starting Address Hi	00
Starting Address L	6B
No. of Points Hi	00
No. of Points Lo	03
Error Check (LRC or CRC)	--

Table 4-2 Modbus Function 3 Example-Query

Response

The register data in the response message is packed as two bytes per register, with the binary contents right justified within each byte. For each register, the first byte contains the high order bits and the second contains the low order bits.

EXAMPLE:
The following example is a response to the query.

Field Name	Example (Hex)
Slave Address	11
Function	03
Byte Count	06
Data Hi (Register 40108)	02
Data Lo (Register 40108)	2B
Data Hi (Register 40109)	00
Data Lo (Register 40109)	00
Data Hi (Register 40110)	00
Data Lo (Register 40110)	64
Error Check (LRC or CRC)	--

Table 4-3 Modbus Function 3 Example-Response

The register 40108 contains two byte values of 02 $2B_{HEX}$ (=555_{DEC}).
The register 40109 contains 00 00_{HEX} (=0_{DEC}).
The register 40110 contains 00 64_{HEX} (=100_{DEC}).

4.4 Modbus RTU Protocol Function 5: Force Single Cells

To send alarms to X11CA-IM serially, use Modbus RTU Protocol function 5. Function 5 allows you to set a single window either to ON or OFF.

Query

The query message specifies the windows reference to be forced. Windows are addressed starting at zero. The first window is addressed as 0.

The requested ON/OFF state is specified by a constant in the query data field. A value of FF 00 hex requests the window to be ON. A value of 00 00 requests it to be OFF. All other values are illegal and will not affect the window.

EXAMPLE:
The following example sets the window 173 ON in the slave device 17 (X11CA-IM).

11_{HEX} = 10001_{BIN} = 17_{DEC}
AC_{HEX} = 10101100_{BIN} = 172_{DEC}

Field Name	Example (Hex)
Slave Address	11
Function	05
Window Address Hi	00
Window Address L	AC
Force Data Hi	FF
Force Data Lo	00
Error Check (LRC or CRC)	--

Table 4-4 Modbus Function 5 Example-Query

Response

The normal response is an echo of the query, returned after the window state has been forced.

EXAMPLE:
The following example is a response to the query.

Field Name	Example (Hex)
Slave Address	11
Function	05
Window Address Hi	00
Window Address L	AC
Force Data Hi	FF
Force Data Lo	00
Error Check (LRC or CRC)	--

Table 4-5 Modbus Function 5 Example-Response

NOTE:
In order to send serial alarms to any X11CA window, its corresponding input channel must be programmed to the serial mode.

5 LED'S STATUS

- The **RUN LED** is a green color LED and starts flashing upon applying power to the unit. When flashing, it indicates the power in on and the firmware is running in the unit.
- The **ERROR LED** is RED and when flashes ON/OFF, it indicates one or more than one alarm boards not responding to the master module.
- The **RXD1, TXD1, RXD2, TXD2** are amber color LEDs and they indicate the transmission and reception of data from port 1 and 2.

6 SETTING THE ALARM MODULE ADDRESSES

The X11-CA-IM (Master Module) Scans all the Alarm boards in the chassis continuously every 25ms/board and the number of Alarm boards to be scanned has to be set by switch SW2 or SW4 depending on the revision of the PCB used and it is shown below:

Alarm Board#	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	SW2-7	SW2-8
1	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	**ON**	OFF	OFF	OFF	OFF	OFF	OFF	OFF
3	OFF	**ON**	OFF	OFF	OFF	OFF	OFF	OFF
4	**ON**	**ON**	OFF	OFF	OFF	OFF	OFF	OFF
5	OFF	OFF	**ON**	OFF	OFF	OFF	OFF	OFF
6	**ON**	OFF	**ON**	OFF	OFF	OFF	OFF	OFF
7	OFF	**ON**	**ON**	OFF	OFF	OFF	OFF	OFF
8	**ON**	**ON**	**ON**	OFF	OFF	OFF	OFF	OFF
9	OFF	OFF	OFF	**ON**	OFF	OFF	OFF	OFF
10	**ON**	OFF	OFF	**ON**	OFF	OFF	OFF	OFF
11	OFF	**ON**	OFF	**ON**	OFF	OFF	OFF	OFF
12	**ON**	**ON**	OFF	**ON**	OFF	OFF	OFF	OFF
13	OFF	OFF	**ON**	**ON**	OFF	OFF	OFF	OFF
14	**ON**	OFF	**ON**	**ON**	OFF	OFF	OFF	OFF
15	OFF	**ON**	**ON**	**ON**	OFF	OFF	OFF	OFF
16	**ON**	**ON**	**ON**	**ON**	OFF	OFF	OFF	OFF
17	OFF	OFF	OFF	OFF	**ON**	OFF	OFF	OFF
18	**ON**	OFF	OFF	OFF	**ON**	OFF	OFF	OFF
19	OFF	**ON**	OFF	OFF	**ON**	OFF	OFF	OFF
20	**ON**	**ON**	OFF	OFF	**ON**	OFF	OFF	OFF
21	OFF	OFF	**ON**	OFF	**ON**	OFF	OFF	OFF
22	**ON**	OFF	**ON**	OFF	**ON**	OFF	OFF	OFF
23	OFF	**ON**	**ON**	OFF	**ON**	OFF	OFF	OFF
24	**ON**	**ON**	**ON**	OFF	**ON**	OFF	OFF	OFF
25	OFF	OFF	OFF	**ON**	**ON**	OFF	OFF	OFF
26	**ON**	OFF	OFF	**ON**	**ON**	OFF	OFF	OFF
27	OFF	**ON**	OFF	**ON**	**ON**	OFF	OFF	OFF
28	**ON**	**ON**	OFF	**ON**	**ON**	OFF	OFF	OFF
29	OFF	OFF	**ON**	**ON**	**ON**	OFF	OFF	OFF
30	**ON**	OFF	**ON**	**ON**	**ON**	OFF	OFF	OFF
31	OFF	**ON**	**ON**	**ON**	**ON**	OFF	OFF	OFF
32	**ON**	**ON**	**ON**	**ON**	**ON**	OFF	OFF	OFF
33	OFF	OFF	OFF	OFF	OFF	**ON**	OFF	OFF
34	**ON**	OFF	OFF	OFF	OFF	**ON**	OFF	OFF

Alarm Board#	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	SW2-7	SW2-8
35	OFF	**ON**	OFF	OFF	OFF	**ON**	OFF	OFF
36	**ON**	**ON**	OFF	OFF	OFF	**ON**	OFF	OFF
37	OFF	OFF	**ON**	OFF	OFF	**ON**	OFF	OFF
38	**ON**	OFF	**ON**	OFF	OFF	**ON**	OFF	OFF
39	OFF	**ON**	**ON**	OFF	OFF	**ON**	OFF	OFF
40	**ON**	**ON**	**ON**	OFF	OFF	**ON**	OFF	OFF
41	OFF	OFF	OFF	**ON**	OFF	**ON**	OFF	OFF
42	**ON**	OFF	OFF	**ON**	OFF	**ON**	OFF	OFF
43	OFF	**ON**	OFF	**ON**	OFF	**ON**	OFF	OFF
44	**ON**	**ON**	OFF	**ON**	OFF	**ON**	OFF	OFF
45	OFF	OFF	**ON**	**ON**	OFF	**ON**	OFF	OFF
46	**ON**	OFF	**ON**	**ON**	OFF	**ON**	OFF	OFF
47	OFF	**ON**	**ON**	**ON**	OFF	**ON**	OFF	OFF
48	**ON**	**ON**	**ON**	**ON**	OFF	**ON**	OFF	OFF
49	OFF	OFF	OFF	OFF	**ON**	**ON**	OFF	OFF
50	**ON**	OFF	OFF	OFF	**ON**	**ON**	OFF	OFF
51	OFF	**ON**	OFF	OFF	**ON**	**ON**	OFF	OFF
52	**ON**	**ON**	OFF	OFF	**ON**	**ON**	OFF	OFF
53	OFF	OFF	**ON**	OFF	**ON**	**ON**	OFF	OFF
54	**ON**	OFF	**ON**	OFF	**ON**	**ON**	OFF	OFF
55	OFF	**ON**	**ON**	OFF	**ON**	**ON**	OFF	OFF
56	**ON**	**ON**	**ON**	OFF	**ON**	**ON**	OFF	OFF
57	OFF	OFF	OFF	**ON**	**ON**	**ON**	OFF	OFF
58	**ON**	OFF	OFF	**ON**	**ON**	**ON**	OFF	OFF
59	OFF	**ON**	OFF	**ON**	**ON**	**ON**	OFF	OFF
60	**ON**	**ON**	OFF	**ON**	**ON**	**ON**	OFF	OFF
61	OFF	OFF	**ON**	**ON**	**ON**	**ON**	OFF	OFF
62	**ON**	OFF	**ON**	**ON**	**ON**	**ON**	OFF	OFF
63	OFF	**ON**	**ON**	**ON**	**ON**	**ON**	OFF	OFF
64	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**	OFF	OFF
65	OFF	OFF	OFF	OFF	OFF	OFF	**ON**	OFF
66	**ON**	OFF	OFF	OFF	OFF	OFF	**ON**	OFF
67	OFF	**ON**	OFF	OFF	OFF	OFF	**ON**	OFF
68	**ON**	**ON**	OFF	OFF	OFF	OFF	**ON**	OFF
69	OFF	OFF	**ON**	OFF	OFF	OFF	**ON**	OFF
70	**ON**	OFF	**ON**	OFF	OFF	OFF	**ON**	OFF
71	OFF	**ON**	**ON**	OFF	OFF	OFF	**ON**	OFF
72	**ON**	**ON**	**ON**	OFF	OFF	OFF	**ON**	OFF
73	OFF	OFF	OFF	**ON**	OFF	OFF	**ON**	OFF
74	**ON**	OFF	OFF	**ON**	OFF	OFF	**ON**	OFF
75	OFF	**ON**	OFF	**ON**	OFF	OFF	**ON**	OFF
76	**ON**	**ON**	OFF	**ON**	OFF	OFF	**ON**	OFF

Alarm Board#	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	SW2-7	SW2-8
77	OFF	OFF	**ON**	**ON**	OFF	OFF	**ON**	OFF
78	**ON**	OFF	**ON**	**ON**	OFF	OFF	**ON**	OFF
79	OFF	**ON**	**ON**	**ON**	OFF	OFF	**ON**	OFF
80	**ON**	**ON**	**ON**	**ON**	OFF	OFF	**ON**	OFF
81	OFF	OFF	OFF	OFF	**ON**	OFF	**ON**	OFF
82	**ON**	OFF	OFF	OFF	**ON**	OFF	**ON**	OFF
83	OFF	**ON**	OFF	OFF	**ON**	OFF	**ON**	OFF
84	**ON**	**ON**	OFF	OFF	**ON**	OFF	**ON**	OFF
85	OFF	OFF	**ON**	OFF	**ON**	OFF	**ON**	OFF
86	**ON**	OFF	**ON**	OFF	**ON**	OFF	**ON**	OFF
87	OFF	**ON**	**ON**	OFF	**ON**	OFF	**ON**	OFF
88	**ON**	**ON**	**ON**	OFF	**ON**	OFF	**ON**	OFF
89	OFF	OFF	OFF	**ON**	**ON**	OFF	**ON**	OFF
90	**ON**	OFF	OFF	**ON**	**ON**	OFF	**ON**	OFF
91	OFF	**ON**	OFF	**ON**	**ON**	OFF	**ON**	OFF
92	**ON**	**ON**	OFF	**ON**	**ON**	OFF	**ON**	OFF
93	OFF	OFF	**ON**	**ON**	**ON**	OFF	**ON**	OFF
94	**ON**	OFF	**ON**	**ON**	**ON**	OFF	**ON**	OFF
95	OFF	**ON**	**ON**	**ON**	**ON**	OFF	**ON**	OFF
96	**ON**	**ON**	**ON**	**ON**	**ON**	OFF	**ON**	OFF
97	OFF	OFF	OFF	OFF	OFF	**ON**	**ON**	OFF
98	**ON**	OFF	OFF	OFF	OFF	**ON**	**ON**	OFF
99	OFF	**ON**	OFF	OFF	OFF	**ON**	**ON**	OFF
100	**ON**	**ON**	OFF	OFF	OFF	**ON**	**ON**	OFF
101	OFF	OFF	**ON**	OFF	OFF	**ON**	**ON**	OFF
102	**ON**	OFF	**ON**	OFF	OFF	**ON**	**ON**	OFF
103	OFF	**ON**	**ON**	OFF	OFF	**ON**	**ON**	OFF
104	**ON**	**ON**	**ON**	OFF	OFF	**ON**	**ON**	OFF
105	OFF	OFF	OFF	**ON**	OFF	**ON**	**ON**	OFF
106	**ON**	OFF	OFF	**ON**	OFF	**ON**	**ON**	OFF
107	OFF	**ON**	OFF	**ON**	OFF	**ON**	**ON**	OFF
108	**ON**	**ON**	OFF	**ON**	OFF	**ON**	**ON**	OFF
109	OFF	OFF	**ON**	**ON**	OFF	**ON**	**ON**	OFF
110	**ON**	OFF	**ON**	**ON**	OFF	**ON**	**ON**	OFF
111	OFF	**ON**	**ON**	**ON**	OFF	**ON**	**ON**	OFF
112	**ON**	**ON**	**ON**	**ON**	OFF	**ON**	**ON**	OFF
113	OFF	OFF	OFF	OFF	**ON**	**ON**	**ON**	OFF
114	**ON**	OFF	OFF	OFF	**ON**	**ON**	**ON**	OFF
115	OFF	**ON**	OFF	OFF	**ON**	**ON**	**ON**	OFF
116	**ON**	**ON**	OFF	OFF	**ON**	**ON**	**ON**	OFF
117	OFF	OFF	**ON**	OFF	**ON**	**ON**	**ON**	OFF
118	**ON**	OFF	**ON**	OFF	**ON**	**ON**	**ON**	OFF

Alarm Board#	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	SW2-7	SW2-8
119	OFF	**ON**	**ON**	OFF	**ON**	**ON**	**ON**	OFF
120	**ON**	**ON**	**ON**	OFF	**ON**	**ON**	**ON**	OFF
121	OFF	OFF	OFF	**ON**	**ON**	**ON**	**ON**	OFF
122	**ON**	OFF	OFF	**ON**	**ON**	**ON**	**ON**	OFF
123	OFF	**ON**	OFF	**ON**	**ON**	**ON**	**ON**	OFF
124	**ON**	**ON**	OFF	**ON**	**ON**	**ON**	**ON**	OFF
125	OFF	OFF	**ON**	**ON**	**ON**	**ON**	**ON**	OFF
126	**ON**	OFF	**ON**	**ON**	**ON**	**ON**	**ON**	OFF
127	OFF	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**	OFF
128	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**	OFF
129	OFF	OFF	OFF	OFF	OFF	OFF	OFF	**ON**
130	**ON**	OFF	OFF	OFF	OFF	OFF	OFF	**ON**
131	OFF	**ON**	OFF	OFF	OFF	OFF	OFF	**ON**
132	**ON**	**ON**	OFF	OFF	OFF	OFF	OFF	**ON**
133	OFF	OFF	**ON**	OFF	OFF	OFF	OFF	**ON**
134	**ON**	OFF	**ON**	OFF	OFF	OFF	OFF	**ON**
135	OFF	**ON**	**ON**	OFF	OFF	OFF	OFF	**ON**
136	**ON**	**ON**	**ON**	OFF	OFF	OFF	OFF	**ON**
137	OFF	OFF	OFF	**ON**	OFF	OFF	OFF	**ON**
138	**ON**	OFF	OFF	**ON**	OFF	OFF	OFF	**ON**
139	OFF	**ON**	OFF	**ON**	OFF	OFF	OFF	**ON**
140	**ON**	**ON**	OFF	**ON**	OFF	OFF	OFF	**ON**
141	OFF	OFF	**ON**	**ON**	OFF	OFF	OFF	**ON**
142	**ON**	OFF	**ON**	**ON**	OFF	OFF	OFF	**ON**
143	OFF	ON	**ON**	**ON**	OFF	OFF	OFF	**ON**
144	**ON**	**ON**	**ON**	**ON**	OFF	OFF	OFF	**ON**
145	OFF	OFF	OFF	OFF	**ON**	OFF	OFF	**ON**
146	**ON**	OFF	OFF	OFF	**ON**	OFF	OFF	**ON**
147	OFF	**ON**	OFF	OFF	**ON**	OFF	OFF	**ON**
148	**ON**	**ON**	OFF	OFF	**ON**	OFF	OFF	**ON**
149	OFF	OFF	**ON**	OFF	**ON**	OFF	OFF	**ON**
150	**ON**	OFF	**ON**	OFF	**ON**	OFF	OFF	**ON**
151	OFF	**ON**	**ON**	OFF	**ON**	OFF	OFF	**ON**
152	**ON**	**ON**	**ON**	OFF	**ON**	OFF	OFF	**ON**
153	OFF	OFF	OFF	**ON**	**ON**	OFF	OFF	**ON**
154	**ON**	OFF	OFF	**ON**	**ON**	OFF	OFF	**ON**
155	OFF	**ON**	OFF	**ON**	**ON**	OFF	OFF	**ON**
156	**ON**	**ON**	OFF	**ON**	**ON**	OFF	OFF	**ON**
157	OFF	OFF	**ON**	**ON**	**ON**	OFF	OFF	**ON**
158	**ON**	OFF	**ON**	**ON**	**ON**	OFF	OFF	**ON**
159	OFF	**ON**	**ON**	**ON**	**ON**	OFF	OFF	**ON**
160	**ON**	**ON**	**ON**	**ON**	**ON**	OFF	OFF	**ON**

Alarm Board#	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	SW2-7	SW2-8
161	OFF	OFF	OFF	OFF	OFF	**ON**	OFF	**ON**
162	**ON**	OFF	OFF	OFF	OFF	**ON**	OFF	**ON**
163	OFF	**ON**	OFF	OFF	OFF	**ON**	OFF	**ON**
164	**ON**	**ON**	OFF	OFF	OFF	**ON**	OFF	**ON**
165	OFF	OFF	**ON**	OFF	OFF	**ON**	OFF	**ON**
166	**ON**	OFF	**ON**	OFF	OFF	**ON**	OFF	**ON**
167	OFF	**ON**	**ON**	OFF	OFF	**ON**	OFF	**ON**
168	**ON**	**ON**	**ON**	OFF	OFF	**ON**	OFF	**ON**
169	OFF	OFF	OFF	**ON**	OFF	**ON**	OFF	**ON**
170	**ON**	OFF	OFF	**ON**	OFF	**ON**	OFF	**ON**
171	OFF	**ON**	OFF	**ON**	OFF	**ON**	OFF	**ON**
172	**ON**	**ON**	OFF	**ON**	OFF	**ON**	OFF	**ON**
173	OFF	OFF	**ON**	**ON**	OFF	**ON**	OFF	**ON**
174	**ON**	OFF	**ON**	**ON**	OFF	**ON**	OFF	**ON**
175	OFF	**ON**	**ON**	**ON**	OFF	**ON**	OFF	**ON**
176	**ON**	**ON**	**ON**	**ON**	OFF	**ON**	OFF	**ON**
177	OFF	OFF	OFF	OFF	**ON**	**ON**	OFF	**ON**
178	**ON**	OFF	OFF	OFF	**ON**	**ON**	OFF	**ON**
179	OFF	**ON**	OFF	OFF	**ON**	**ON**	OFF	**ON**
180	**ON**	**ON**	OFF	OFF	**ON**	**ON**	OFF	**ON**
181	OFF	OFF	**ON**	OFF	**ON**	**ON**	OFF	**ON**
182	**ON**	OFF	**ON**	OFF	**ON**	**ON**	OFF	**ON**
183	OFF	**ON**	**ON**	OFF	**ON**	**ON**	OFF	**ON**
184	**ON**	**ON**	**ON**	OFF	**ON**	**ON**	OFF	**ON**
185	OFF	OFF	OFF	**ON**	**ON**	**ON**	OFF	**ON**
186	**ON**	OFF	OFF	**ON**	**ON**	**ON**	OFF	**ON**
187	OFF	**ON**	OFF	**ON**	**ON**	**ON**	OFF	**ON**
188	**ON**	**ON**	OFF	**ON**	**ON**	**ON**	OFF	**ON**
189	OFF	OFF	**ON**	**ON**	**ON**	**ON**	OFF	**ON**
190	**ON**	OFF	**ON**	**ON**	**ON**	**ON**	OFF	**ON**
191	OFF	**ON**	**ON**	**ON**	**ON**	**ON**	OFF	**ON**
192	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**	OFF	**ON**
193	OFF	OFF	OFF	OFF	OFF	OFF	**ON**	**ON**
194	**ON**	OFF	OFF	OFF	OFF	OFF	**ON**	**ON**
195	OFF	**ON**	OFF	OFF	OFF	OFF	**ON**	**ON**
196	**ON**	**ON**	OFF	OFF	OFF	OFF	**ON**	**ON**
197	OFF	OFF	**ON**	OFF	OFF	OFF	**ON**	**ON**
198	**ON**	OFF	**ON**	OFF	OFF	OFF	**ON**	**ON**
199	OFF	**ON**	**ON**	OFF	OFF	OFF	**ON**	**ON**
200	**ON**	**ON**	**ON**	OFF	OFF	OFF	**ON**	**ON**

Table 6-1 Setting Alarm Module Addresses

7 PRGM/RUN SWITCH

Use the PRGM/RUN switch on the X11CA-IM to set the mode to either program mode or run mode.

7.1 Program Mode

In the program mode, you can configure or change the configuration of the alarm modules with the Configuration software running on the host computer.

To set X11CA-IM to program mode, set the switch to PRGM and make sure that the cable is connected from the Modbus communication port (P2) on the X11CA-IM to the serial port of the host computer. Verify that the RUN and ERROR LEDs flash simultaneously.

Refer to *X11CA Configuration Software User's Manual* (Doc # :*X11CA-3001-IOM*) for detail.

7.2 Run Mode

In the run mode, the X11CA-IM scans all the activities of the alarm modules and activates the relay outputs and its push button functions.

7.2.1 Relay Outputs

There are five Relays on the X11-CA-IM as follows:

- ? RUN Relay indicates the power on condition and is normally energized
- ? REFLASH Relay is not used in this revision of the firmware.
- ? CTA Relay is a Common Trouble Alarm and will be energized if one or more than one input in any Alarm card is on.
- ? Relay A1 is HORN1 relay and will be energized according to the sequence programmed in the ALARM card.
- ? Relay A2 is HORN2 relay and will be energized according to the sequence programmed in the ALARM card.

7.2.2 Functions of the Push Buttons

The following is the summary of the push button functions.

Button Name	Full Name	Description
TEST	Test	Tests properties of alarm modules.
SIL	Silence	Stops the sound of the audio devices.
ACK	Acknowledge	Acknowledges the alarms.
RST	Reset	Resets inputs according to the sequence type.
FRST	First Out Reset	Resets the first out alarm in the group .
GF1	General Function 1	Inhibits the GF1 inhibit signals while the button is being pressed.
GF2	General Function 2	Inhibits the GF2 inhibit signals while the button is being pressed.

Table 7-1 Push Button Functions

8 APPENDIX A: LIST OF TABLES

9 APPENDIX B: LIST OF FIGURES