

Alarm Annunciator



Features

- 12 or 20 windows. Replaceable LED modules
- 11 Alarm Sequences as per ISA-18.1 standard
- Each channel/window fully field programmable
- RS232 or RS485 MODBUS-RTU communication
- Repeat relay for each window and multifunction relays
- Sleep or unattended mode
- Auto-silence and auto-acknowledge

Table of Contents

1.0 Introduction.....	4
1.1 Model Number Description.....	5
2.0 System Description and Features.....	6
2.1 Features.....	6
2.2 Pushbuttons and Status LED.....	7
2.3 Power Up.....	8
2.4 Sleep/Unattended Mode.....	8
2.5 Relay Outputs.....	8
3.0. Alarm Sequences.....	9
3.1 Follower.....	9
3.2 Sequence A, Automatic Reset.....	9
3.3 Sequence M, Manual Reset.....	9
3.4 Sequence R, Ringback.....	10
3.5 Sequence R-12, Ringback with Auto Acknowledge.....	10
3.6 Sequence F1A, Automatic Reset First Out with No Subsequent Alarm State.....	11
3.7 Sequence F1M, Manual Reset First Out with No Subsequent Alarm State.....	11
3.8 Sequence F2A, Automatic Reset First Out with No Subsequent Alarm Flashing.....	12
3.9 Sequence F2M, Manual Reset First Out with No Subsequent Alarm Flashing.....	12
3.10 Sequence F3A, Automatic Reset First Out with First Out Flashing and Reset Pushbutton.	13
3.11 Sequence F3M, Manual Reset First Out with First Out Flashing and Reset Pushbutton.....	13
4.0 Soft Settings.....	14
4.1 General Settings.....	14
4.1.1 Internal Buzzer On/Off.....	14
4.1.2 Auto Alarm Silence, Auto Alarm Silence Delay.....	14
4.1.3 Auto Ringback Silence, Auto Ringback Silence Delay.....	14
4.1.4 Auto Acknowledge, Auto Acknowledge Delay.....	14
4.1.5 Auxiliary Output Relay Function.....	14
4.1.6 Communication Baud Rate, Data Format and Address.....	15
4.2 Individual Settings.....	15
4.2.1 Input Contact.....	15
4.2.2 Alarm Sequence.....	15
4.2.3 Internal Buzzer Type.....	16
4.2.4 Input Delay.....	16
4.2.5 Auxiliary Output Relay Select.....	16
4.3 Configuration via Pushbutton.....	17
4.3.1 Configuration Settings.....	17
4.3.2 Communication Settings.....	21
4.4 Configuration via ANTools.....	23
4.4.1 Installation.....	23
4.4.2 Start Up.....	23
4.4.3 Communication Settings.....	24
4.4.4 Menu Items.....	24
4.4.5 Error Messengers.....	25
5.0 Technical Data.....	27
5.1 General and Electrical.....	27
5.2 Dimensions.....	28
5.2.1 AN112	28

5.2.2 AN120.....29

5.3 Connection Diagram.....30

5.3.1 AN112 With Repeat Relay30

5.3.2 AN120 With Repeat Relay32

5.3.3 AN112 Without Repeat Relays.....33

5.3.4 AN120 Without Repeat Relay34

6.0 Modbus-RTU.....35

6.1 Modbus Protocol.....35

6.2 Modbus RTU Table.....37

1.0 Introduction

Annunciator is used to call attention to abnormal process conditions. It includes individual illuminated visual displays that are labelled to identify the particular monitored variable and audible devices. It may also call attention to the return to normal of the process conditions.

Visual displays usually flash to indicate abnormal process conditions. Manual operation of pushbuttons are usually required to silence audible devices and acknowledge new alarms. Visual displays usually change from flashing to on when alarms are acknowledged.

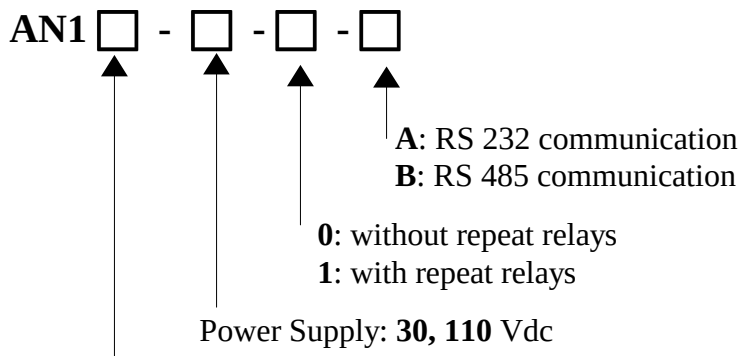
Additional types of flashing can indicate that process conditions have returned to normal or which of a group of alarm points operated first. Additional pushbuttons can be used to acknowledge alarms that return to normal, to reset first out indications, and to test annunciator lamps and circuits.

The Mikro AN1xx Series Alarm Annunciator system is designed to perform all the standard required functions of an annunciator with a high degree of reliability. It also has the flexibility of configuring settings via pushbuttons or a PC.

These system includes a compact casing, removable windows front panel with engraved label, replaceable LED module, integrated pushbuttons, status LED, internal buzzer, opto-isolated inputs and relay outputs.

1.1 Model Number Description

Order code:



Number of Windows: **12, 20**

For example: 12 windows, 30Vdc, with repeat relays, RS232 communication:

AN**12-30-1-A**

Windows Colour

Indicates colour of each window during ordering on the form below: R-Red, A-Amber

Windows Colour and text order form:

AN112

[Colour code] [Windows text]			

AN120

[Colour code] [Windows text]			

2.0 System Description and Features

2.1 Features

AN1xx Annunciator includes a compact casing, removable windows front panel with engraved label, replaceable LED module, integrated pushbuttons, status LED, internal buzzer, opto-isolated inputs and relay outputs.

Windows (visual display) flash and internal buzzer (audible devices) to indicate abnormal process conditions. Manual operation of pushbuttons are usually required to silence audible devices and acknowledge new alarms. Windows usually change from flashing to on when alarms are acknowledged.

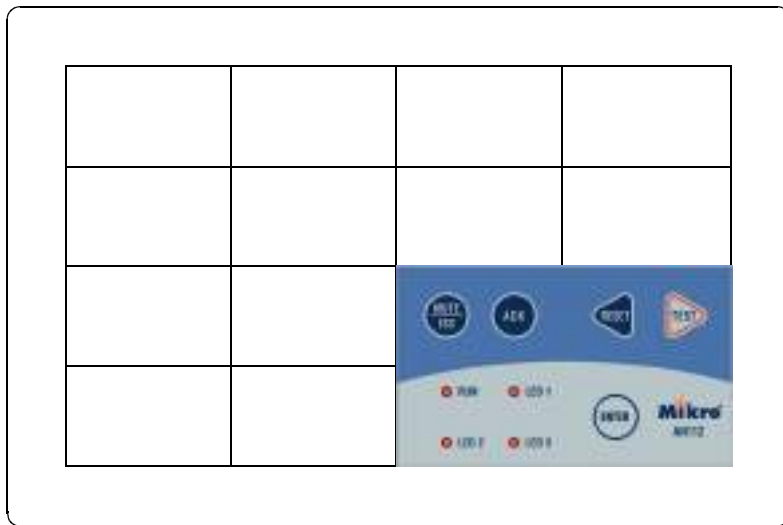


Figure 2.1: Front layout of 12 windows annunciator.

- 12, 20 windows. Replaceable super-bright LED modules, with choice of amber or red illumination
- 11 Alarm Sequences as per ISA-18.1 standard
- Each channel/window fully field programmable, either from front panel built-in pushbutton or using PC
- Option of either RS232 or RS485 modbus-RTU communication. User-friendly configuration software will be supplied free of charge.
- Repeat relay for each window as well as numerous configurable multifunction output relays for connection to external equipment to form alarm management system
- Sleep or unattended mode feature is available, for stations not permanently manned
- Auto-silence and auto-acknowledge features, with delay settable from 1 – 255 s

2.2 Pushbuttons and Status LED



Figure 2.2: Front Panel of Annunciator

RUN LED on to indicate normal operation mode. It slow blinks during sleep/unattended mode. LED1, LED2 and LED3 are used during soft settings configuration mode using pushbuttons.

There are 5 pushbuttons available:

- i)  **Mute/Esc:** To off the alarm audible device. This avoids continuing noise during new alarm sequence state while retaining the flashing visual displays for reviewing or logging. It also off the ringback audible output.
- ii)  **Acknowledge:** To acknowledge new alarms. The audible device is off and the visual displays change to acknowledged sequence.
- iii)  **Reset/Left Arrow:** To reset the sequence to the normal after acknowledge when the process condition returns to normal. Auto reset sequences do not required reset pushbutton.

Also used in soft settings configuration mode as Left Arrow.
- iv)  **Test/Right Arrow:** To perform diagnosis manually.

Visual test: When pressed down, all the visual display will on, when released, current alarm state is resumed.

Operational test: When pressed and hold for more than 5 seconds, the system simulates simultaneous abnormal conditions on all inputs points. Release of the button simulates return to normal. Operation of pushbuttons are required to complete the sequence.

Also used in soft settings configuration mode as Right Arrow.

- v)  **Enter:** To enter soft settings configuration mode. To confirm setting value.

First out reset: Available as field contact input. Used only on F3A/F3M sequences. To change the first out visual displays to be the same as subsequent visual displays.

Pushbutton can be **Disabled** by shorting Key Enable Contact Input to common.

2.3 Power Up

Upon power up All the display will on and internal buzzer will sound for 1 second as self test. Self supervisory relay will turn on if no internal error. RUN LED turns on to indicate normal operation mode.

Power up in last state: During power on, the unit will recall the last state before power down. The states are visual display, audible device status and the output relay status.

2.4 Sleep/Unattended Mode

By closing Sleep contact input, sleep/unattended mode is activated.

In this mode, Run LED Slow blinks. Visual display and audible is off. Relay outputs and ringback audible device are still active. The detection of alarm is still active in the background.

2.5 Relay Outputs

There are few output relays available:

- i) Individual contact follower.** These outputs follow state of input contacts.
- ii) Auxiliary outputs (AUX1-AUX3).** These multifunction outputs are shared among all the alarm points and can be configured as:
 - a) Audible device follower. Output on when new alarm, off when mute, or acknowledge pressed. (independent of internal buzzer setting)
 - b) Visual device follower - Acknowledge off. Output on when new alarm, off when acknowledge pressed. (used to indicate that uninspected new alarm available)
 - c) Visual device follower. Output on when new alarm, off when all window points that relate to this output have reset (off).
 - d) Contact follower. Output on when any alarm point that enables this output abnormal. (disabled for follower sequence)

These outputs are active only when enabled by individual alarm point. An output can be enabled by few alarm points to enabled alarm group indication.

iv) Self supervisory output (SSP). This output on when the annunciator is on. This output off when detects internal fault or failure.

v) Ringback audible device (RBCK). This audible output is available for ringback sequences. It is on when any alarm point has a ringback state.

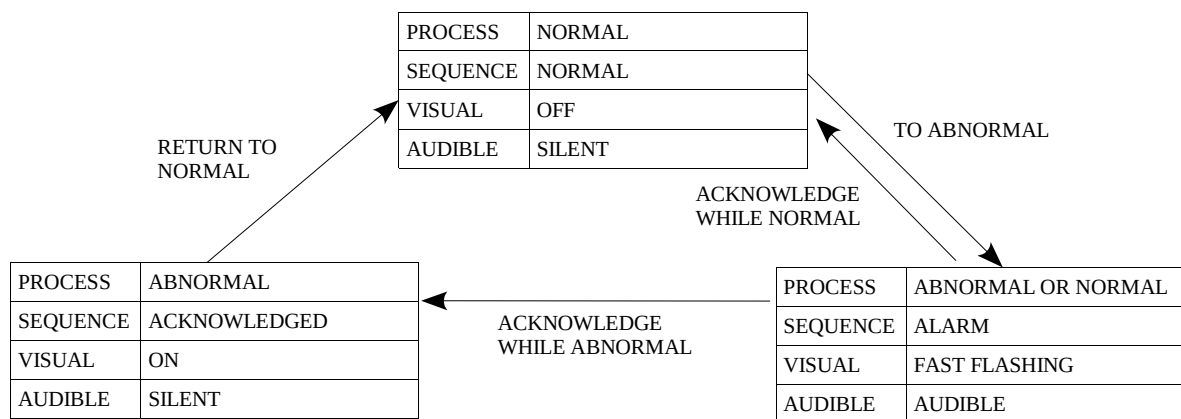
3.0. Alarm Sequences

The following alarm sequences are available:

3.1 Follower

No alarm sequence is related. The Visual display will on when its input contact abnormal, off when input contact normal.

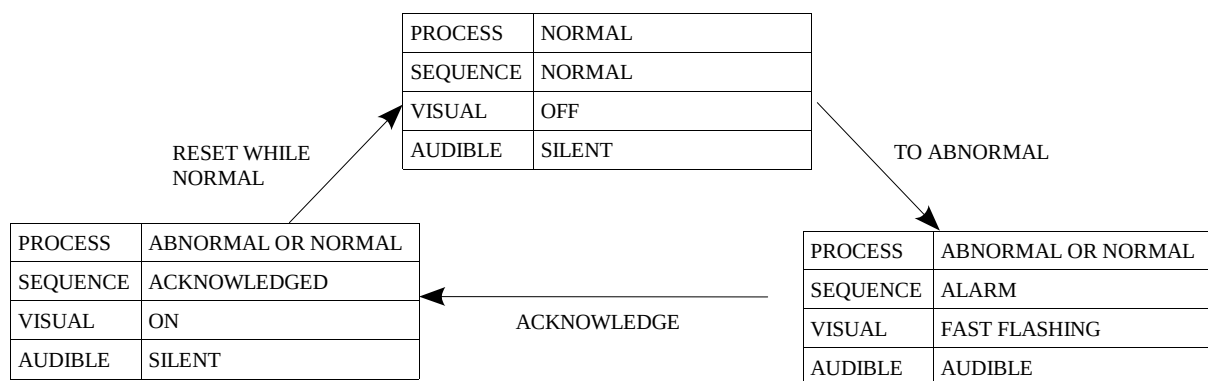
3.2 Sequence A, Automatic Reset



Sequence features

1. Acknowledge, Test, and Mute pushbuttons.
2. Audible alarm can be silenced by pressing Mute pushbutton.
3. The audible device is silenced and flashing stops when acknowledged
4. Automatic reset of acknowledged alarm when process conditions return to normal.
5. Operational test.

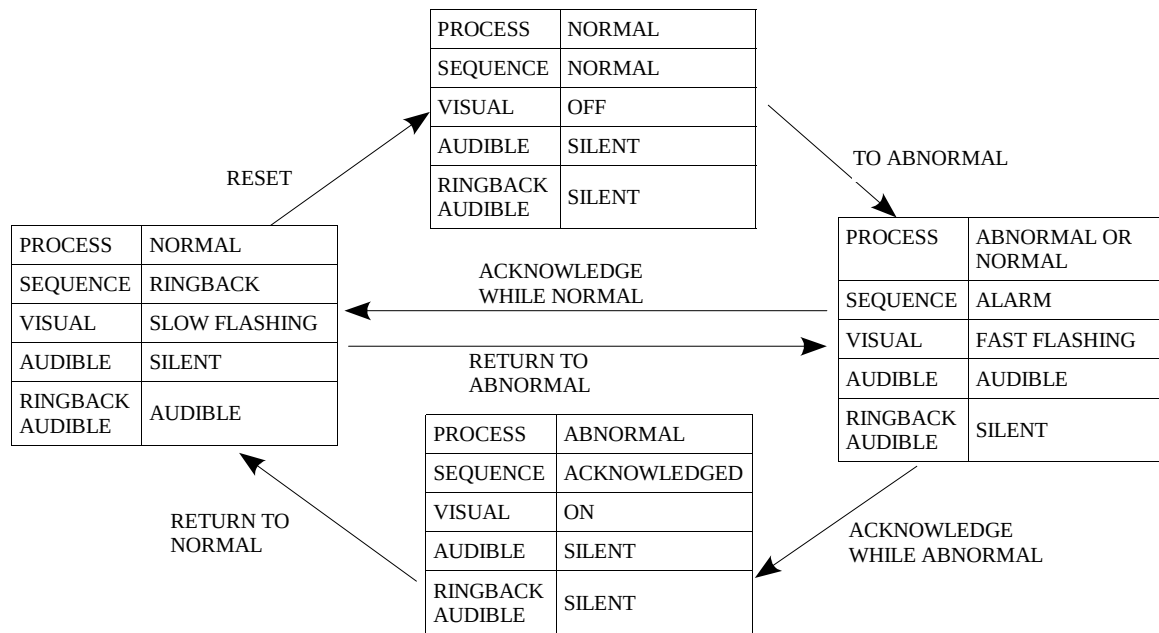
3.3 Sequence M, Manual Reset



Sequence features

1. Acknowledge, Reset, Test, and Mute pushbuttons.
2. Audible alarm can be silenced by pressing Mute pushbutton.
3. The audible device is silenced and flashing stops when acknowledged
4. Manual reset of acknowledged alarm when process conditions return to normal.
5. Operational test.

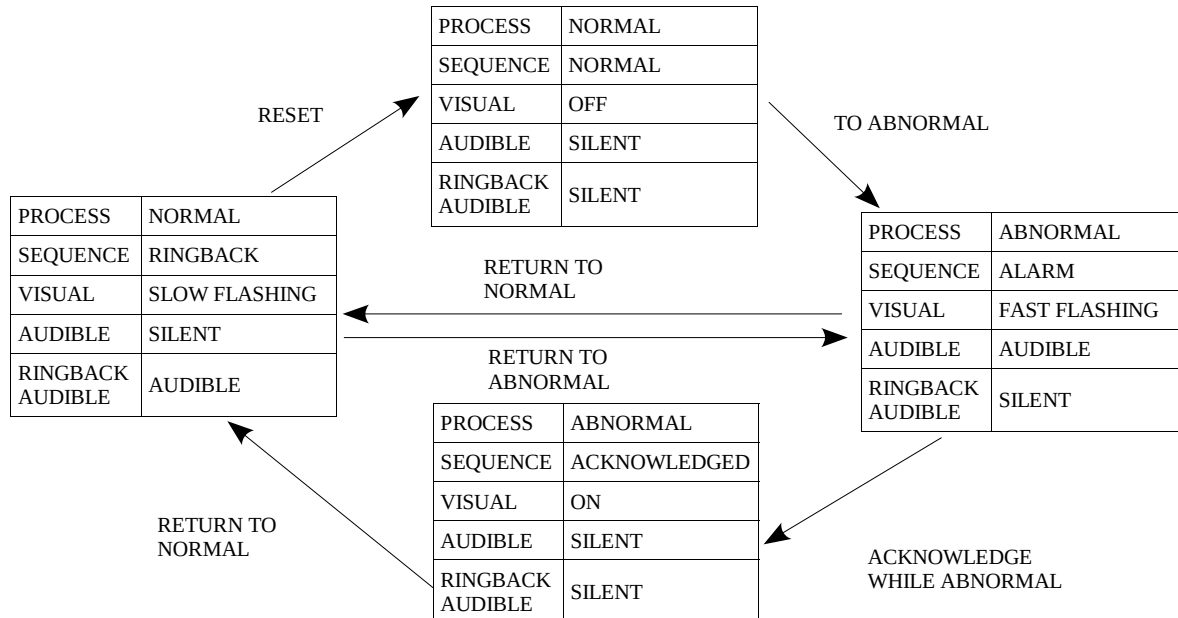
3.4 Sequence R, Ringback



Sequence features

1. Acknowledge, Reset, Test, and mute pushbuttons.
2. Alarm and ringback audible devices.
3. Audible alarm or ringback alarm can be silenced by pressing Mute pushbutton.
4. Ringback visual and audible alarm when process conditions return to normal.
5. Manual reset of ringback indications.
6. Operational test.

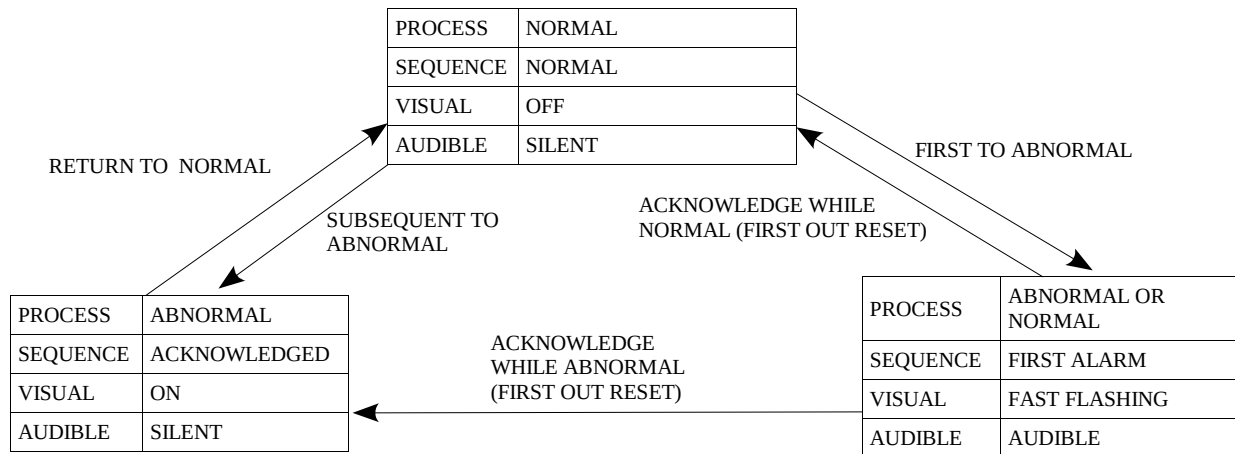
3.5 Sequence R-12, Ringback with Auto Acknowledge



Sequence features

1. Acknowledge, Reset, Test, and Mute pushbuttons.
2. Alarm and ringback audible devices.
3. Audible alarm or ringback alarm can be silenced by pressing Mute pushbutton.
4. Momentary alarms go to ringback sequence without operation of the acknowledge pushbutton.
5. Ringback visual and audible alarm when process conditions return to normal.
6. Manual reset of ringback indications.
7. Operational test.

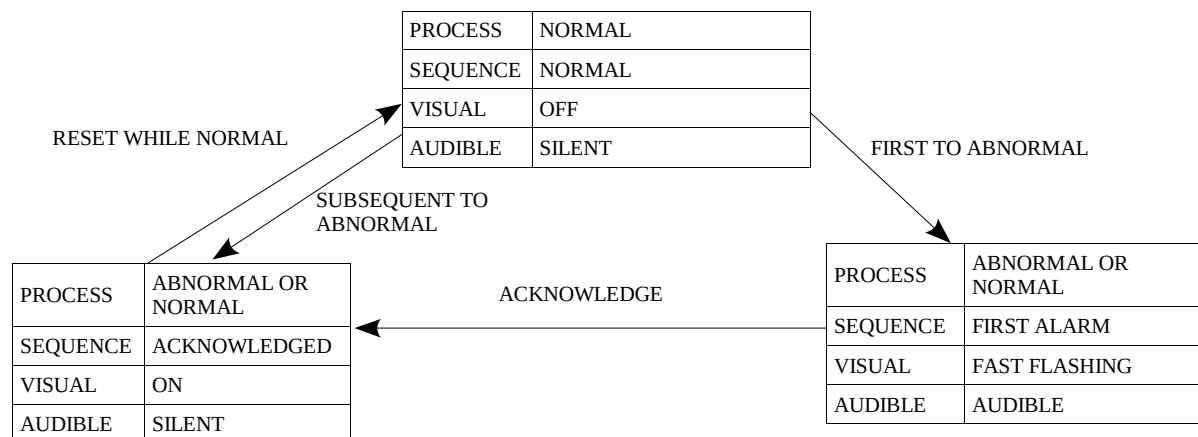
3.6 Sequence F1A, Automatic Reset First Out with No Subsequent Alarm State



Sequence features

1. Acknowledge, Test, and Mute pushbuttons.
2. Alarm audible devices.
3. Audible alarm can be silenced by pressing Mute pushbutton.
4. Flashing and audible indications for first alarm only. New subsequent alarms go to the acknowledge state.
5. First out indication is reset and the audible is silenced when acknowledged.
6. Automatic reset of acknowledged alarm when process conditions return to normal.
7. Operational test.

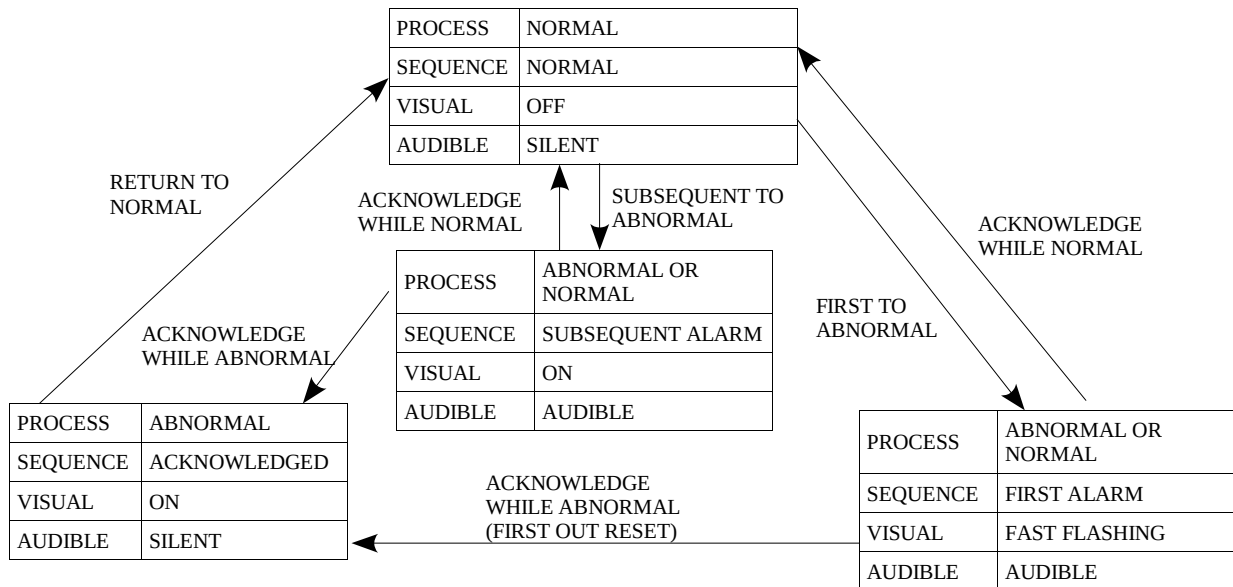
3.7 Sequence F1M, Manual Reset First Out with No Subsequent Alarm State



Sequence features

1. Acknowledge, Reset, Test, and Mute pushbuttons.
2. Alarm audible devices.
3. Audible alarm can be silenced by pressing Mute pushbutton.
4. Flashing and audible indications for first alarm only. New subsequent alarms go to the acknowledge state.
5. First out indication is reset and the audible is silenced when acknowledged.
6. Manual reset of acknowledged alarm when process conditions return to normal.
7. Operational test.

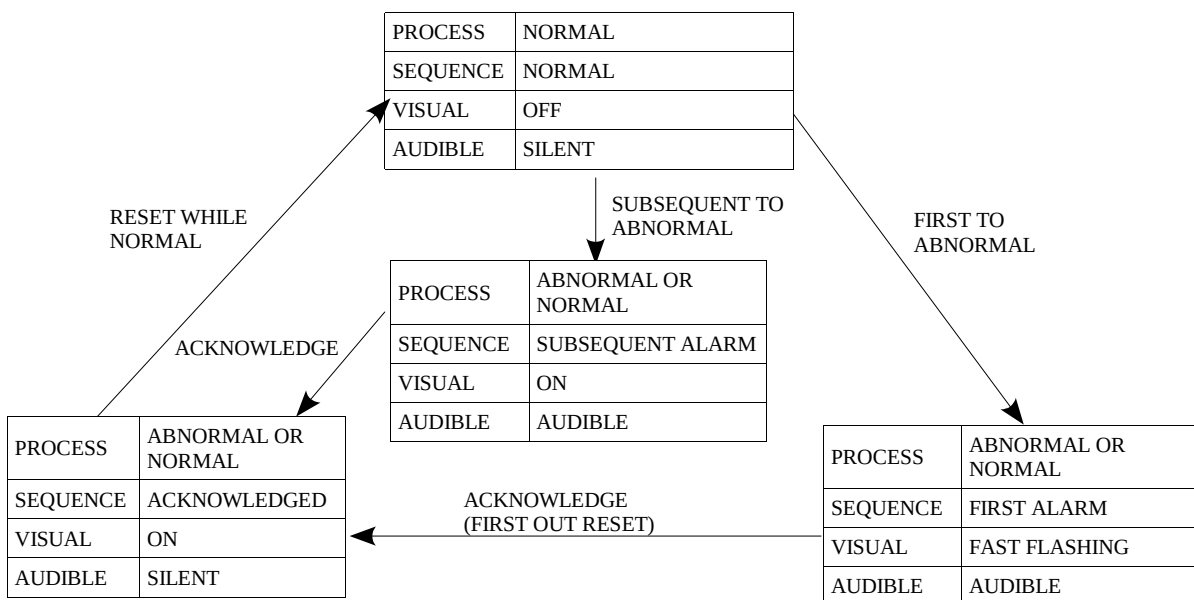
3.8 Sequence F2A, Automatic Reset First Out with No Subsequent Alarm Flashing



Sequence features

1. Acknowledge, Test, and Mute pushbuttons.
2. Alarm audible devices.
3. Audible alarm can be silenced by pressing Mute pushbutton.
4. Flashing indications for first alarm. New subsequent alarms have same visual indication as acknowledged alarms.
5. First out indication is reset and the audible is silenced when acknowledged.
6. Automatic reset of acknowledged alarm when process conditions return to normal.
7. Operational test.

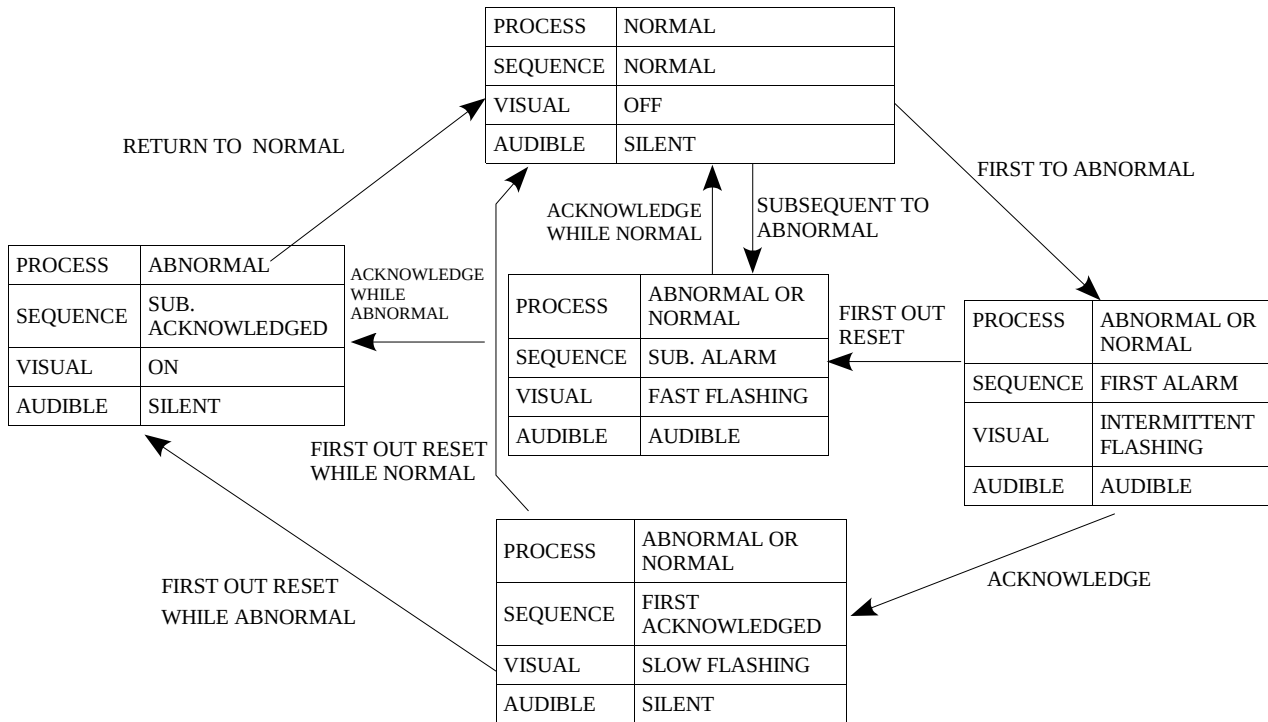
3.9 Sequence F2M, Manual Reset First Out with No Subsequent Alarm Flashing



Sequence features

1. Acknowledge, Test, and Mute pushbuttons.
2. Alarm audible devices.
3. Audible alarm can be silenced by pressing Mute pushbutton.
4. Flashing indications for first alarm. New subsequent alarms have same visual indication as acknowledged alarms.
5. First out indication is reset and the audible is silenced when acknowledged.
6. Manual reset of acknowledged alarm when process conditions return to normal.
7. Operational test.

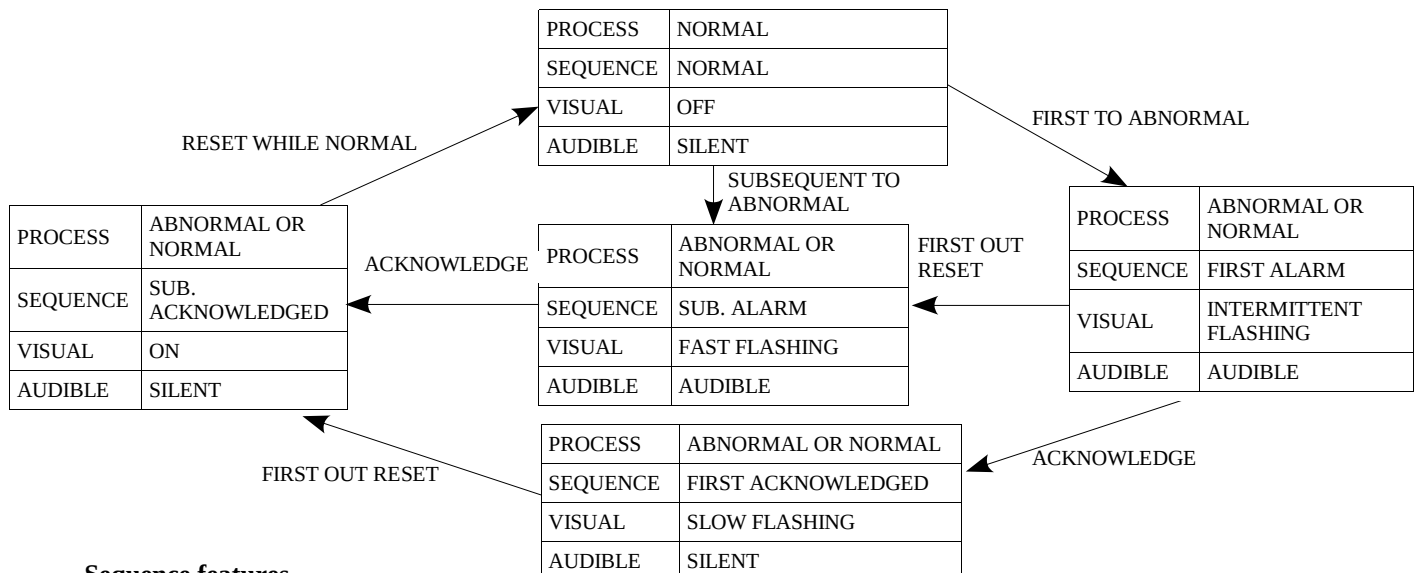
3.10 Sequence F3A, Automatic Reset First Out with First Out Flashing and Reset Pushbutton



Sequence features

1. Acknowledge, First out Reset, Test, and Mute pushbuttons.
2. Alarm audible devices.
3. Audible alarm can be silenced by pressing Mute pushbutton.
4. First out flashing different from subsequent flashing.
5. First out Reset pushbutton to change the first out visual indication to be the same as subsequent visual indications.
6. Automatic reset of acknowledged alarm when process conditions return to normal.
7. Operational test.

3.11 Sequence F3M, Manual Reset First Out with First Out Flashing and Reset Pushbutton



Sequence features

1. Acknowledge, Reset, Test, and Mute pushbuttons.
2. Alarm audible devices.
3. Audible alarm can be silenced by pressing Mute pushbutton.
4. First out flashing different from subsequent flashing.
5. First out Reset pushbutton to change the first out visual indication to be the same as subsequent visual indications.
6. Manual reset of acknowledged alarm when process conditions return to normal.
7. Operational test.

4.0 Soft Settings

The soft settings can be configured through Modbus-RTU RS232 or RS485 interface to PC based ANTools software, or via built in pushbuttons.

4.1 General Settings

General settings that affects the whole Annunciator unit

4.1.1 Internal Buzzer On/Off

To turn the internal buzzer on or off. This will not affect the Auxiliary output relays that configured into audible device follower.

4.1.2 Auto Alarm Silence, Auto Alarm Silence Delay

If enabled, the audible alarm that triggers by any alarm will be off after the Auto Alarm Silence Delay. Settings are Disabled, Enabled with 1s to 255s delay (counting from latest alarm). This will also off the auxiliary output relays if configured as audible device follower output.

4.1.3 Auto Ringback Silence, Auto Ringback Silence Delay

If enabled, the Ringback output relay will be off after the Auto ringback silence delay. Settings are Disabled, Enabled with 1s to 255s (counting from latest ringback state).

Note: Auto alarm silence and Auto ringback silence is tied together when configured via pushbutton.

4.1.4 Auto Acknowledge, Auto Acknowledge Delay

If enabled, the annunciator will acknowledge to alarm after the Auto acknowledge delay as if the acknowledge button is pressed. Settings are Disabled, Enabled with 1s to 255s (counting from latest alarm).

4.1.5 Auxiliary Output Relay Function

AUX1, AUX2 and AUX3 output relays can be configured to perform one of the functions below:

a) Contact follower - NO (Normally Open)

The output is off (Open) when ALL the alarm point input contacts that select it are Normal. The output is on (Close) when ANY of the alarm point input contacts that selects it is abnormal.

b) Contact follower - NC (Normally Close)

The output is on (Close) when ALL the alarm point input contacts that select it are Normal. The output is off (Open) when ANY of the alarm point input contact that selects it is abnormal.

c) Visual device follower – Ack off

The output is on when the alarm point that selects it in alarm state. The output is off when acknowledge is pressed.

d) Audible device follower

The output is on when the alarm point that selects it in alarm state. The output is off when mute is pressed.

e) Visual device follower

The output is on when the alarm point that selects it in alarm state. The output is off when all the alarm points that select it normal.

Refer also to *4.2.5 Auxiliary Output Relay Select*.

Note: the Auxiliary output relay is not function if the alarm sequence of the alarm point is set to Follower.

4.1.6 Communication Baud Rate, Data Format and Address

These settings can be configured via push buttons only. The setting should tally with the settings of Modbus master (PC ANTools or other Modbus master).

Baud rate: This is the speed of the communication in bits per second (bps). Select between 300, 600, 1200, 2400, 4800, 9600, 19200, 38400 and 57600bps.

Data format:

Stop Bits. This is the number of bits at the end of data stream.

Parity. This is the error checking method of the data stream.

Select between

1. No parity, 1 stop bit
2. No parity, 2 stop bits
3. Even parity, 1 stop bit
4. Odd parity, 1 stop bit

Communication address: This is the Modbus address of the annunciator. Combine the low and high address settings to get address between 0 to 149.

4.2 Individual Settings

Each alarm point can have its own settings

4.2.1 Input Contact

Defines the way input contact behaves. For Normally Open, the input is normal when open, abnormal when close. For Normally Close, the input is normal when close, abnormal when open.

4.2.2 Alarm Sequence

Manual, Auto, Ringback, Ringback 12, F1M, F1A, F2M, F2A, F3M, F3A, Follower.

Please refer to *3.0. Alarm Sequences* for description of each sequence.

Note: For F3M and F3A sequence, external First Out Reset button should be connected.

4.2.3 Internal Buzzer Type

Sets the internal buzzer ring type if the buzzer is triggered by this alarm point.

- a) Off. The buzzer is always off.
- b) Constant. Buzzer on when there is an alarm.
- c) 0.9Hz. Buzzer on intermittently at 0.9Hz when there is an alarm.
- c) 2.2Hz. Buzzer on intermittently at 2.2Hz when there is an alarm.

Note: Internal buzzer is always off If *4.1.1 Internal Buzzer On/Off* is set to off.

4.2.4 Input Delay

This is the response time of the input contact, a short time makes the input more sensitive, a long time makes it less sensitive. Value range is 2.5ms to 635ms. Only certain values can be set using pushbuttons. Value is rounded to nearest 5ms when it is set with ANTools.

4.2.5 Auxiliary Output Relay Select

Selects which AUX1, AUX2 and AUX3 relay is triggered by the state change of input contact or alarm states of this alarm point. Refer to *4.1.5 Auxiliary Output Relay Function* for description of the output function.

Note: the Auxiliary relay output is not function if the alarm sequence of the alarm point is set to Follower.

4.3 Configuration via Pushbutton

These 4 buttons are used in soft settings configuration mode:



Left and Right buttons. To select setting, to select alarm point, to change value



previous

To Enter into next level with selected setting/alarm point. To save value and return to level.



To return to previous level, to return without saving value.

4.3.1 Configuration Settings

Configuration mode of Group1 settings is entered by **Pressing and Holding Enter for 3 to 4 seconds**. A beep sound indicates entering of configuration mode with setting 1 selected. LED2 on and flash intermittently. Figure 4.1 shows the flow of Configuration settings configuration mode. Table 4.1 shows the visual display for each settings.

Press  to cycle the setting from 1 to 13, the RUN LED, LED2, LED3 and LED4 indicate currently selected setting. These LEDs will blink intermittently.

For settings 6 to 13, press Enter to go into value change level. The windows 1 to 4 will **Slow blink** to indicate current value, press  to change value, press Enter to save value and exit to previous level. Press Esc to return to previous level and cancel the change if Enter has not been pressed.

* Settings 1 to 5 is individual alarm point settings, the particular alarm point needs to be selected before its value can be changed. After pressing Enter at settings 1 to 5, the window will **Fast blink** to indicate the selected alarm point. Press  and Enter to select the alarm point and go into value change level. Global change can be performed by pressing Enter when **All** the windows Fast blink. Press Esc to return to previous level.

The unit will exit from configuration mode if no button is pressed for more that 3 minutes.

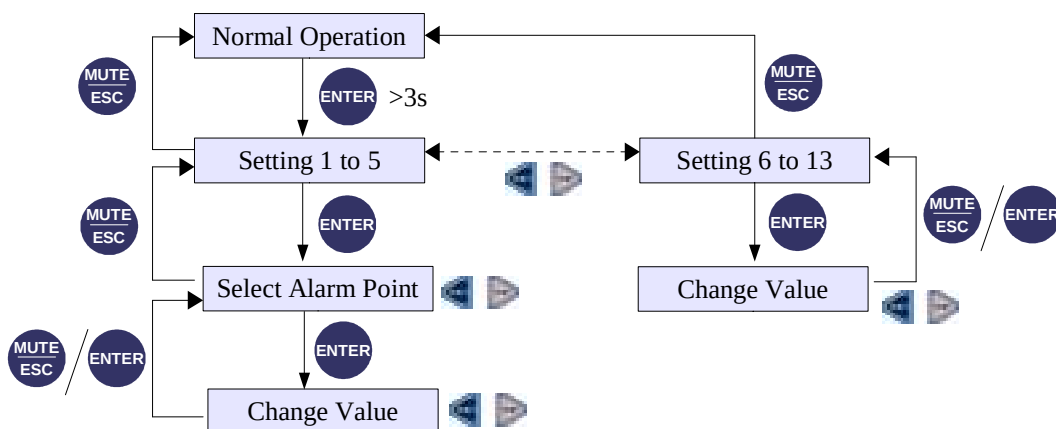


Figure 4.1: Flow chart of Configuration settings

Settings	LED		Window		Value
	RUN LED2	LED1 LED3	3 1	4 2	
1. Input Contact Type *	☐	☐			Normally open [#]
	☒	☐			Normally close
2. Alarm Sequence *	☐	☐			Manual reset [#]
	☐	☒			Auto reset
					Ringback
					Ringbak 12
					F1M
					F1A
					F2M
					F2A
					F3M
					F3A
					Follower
3. Internal Buzzer Type *	☐	☐			Off
	☒	☒			Constant [#]
					Intermittent 1 (0.9Hz)
					Intermittent 2 (2.2Hz)
4. Output Select *	☒	☐			None
	☐	☐			Aux output 1 [#]
					Aux output 2
					Aux output 1 and 2
					Aux output 3
					Aux output 1 and 3
					Aux output 2 and 3
					Aux output 1, 2 and 3
5. Input Delay *	☒	☐			3ms
	☒	☐			5ms [#]
					10ms
					15ms
					20ms
					25ms
					30ms
					40ms
					50ms
					60ms

Settings	LED		Window		Value
	RUN LED2	LED1 LED3	3 1	4 2	
					80ms
					100ms
					150ms
					300ms
					600ms
6. Internal Buzzer					Buzzer on [#]
					Buzzer off
7. Auto Alarm/Ringback Silence					Disabled [#]
					Enabled
8. Auto Alarm/Ringback Silence Delay					5s
					10s
					15s
					20s
					30s [#]
					40s
					50s
					60s
					80s
					100s
					130s
					160s
					190s
					220s
					250s
9. Auto Acknowledge					Enabled
					Disabled [#]
10. Auto Acknowledge Delay					5s
					10s
					15s
					20s
					30s [#]
					40s
					50s
					60s
					80s

Settings	LED		Window		Value
	RUN LED2	LED1 LED3	3 1	4 2	
					100s
					130s
					160s
					190s
					220s
					250s
11. Aux Output 1 Configuration					Contact follower - NO
					Contact follower - NC
					Visual device follower – Ack off
					Audible device follower [#]
					Visual device follower
12. Aux Output 2 Configuration					Contact follower - NO [#]
					Contact follower - NC
					Visual device follower – Ack off
					Audible device follower
					Visual device follower
13. Aux Output 3 Configuration					Contact follower - NO [#]
					Contact follower - NC
					Visual device follower – Ack off
					Audible device follower
					Visual device follower

Table 4.1

* Individual alarm point settings

Default value

4.3.2 Communication Settings

Group2 settings define the Modbus communication data format.

Configuration mode of Group2 settings is entered by **Pressing and Holding Enter And Test together for 3 to 4 seconds**. A beep sound indicates entering of configuration mode with setting 1 selected. LED2 on and flash intermittently. LED1 always on to indicate Communication settings. Figure 4.2 shows the flow of Communication settings configuration mode. Table 4.2 shows the visual display for each settings.

Press   to cycle the setting to change from 1 to 4. the RUN LED, LED2, LED3 will cycle to indicate currently selected setting. These LEDs will blink intermittently.

Press Enter to go into value change level. The windows 1 to 4 will **Slow blink** to indicate current value, press   to change value, press Enter to save value and exit to previous level. Press Esc to return to previous level and cancel the change if Enter has not been pressed.

The unit will exit from configuration mode if no button pressed for more that 3 minutes.

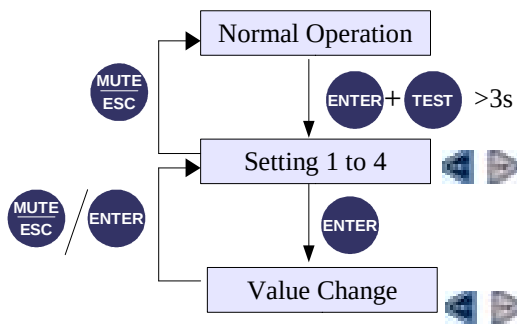


Figure 4.2: Flow chart of Communication settings

Settings	LED RUN LED2 LED1 LED3	Window		Value
		3 1	4 2	
1. Communication Baud Rate	☐ ☒	☒	☐	300bps
	☒ ☐	☐	☒	600bps
	☐ ☐	☒	☒	1200bps
	☐ ☐	☒	☐	2400bps
	☐ ☐	☒	☐	4800bps
	☐ ☐	☒	☒	9600bps [#]
	☐ ☐	☒	☒	19200bps
	☐ ☐	☐	☒	38400bps
	☐ ☐	☒	☒	57600bps
2. Communication Format	☐ ☒	☒	☐	No parity, 1 stop bit
	☐ ☒	☐	☒	No parity, 2 stop bits
	☐ ☐	☒	☒	Even parity, 1 stop bit [#]
	☐ ☐	☒	☐	Odd parity, 1 stop bit

Settings	LED		Window		Value
	RUN LED2	LED1 LED3	3 1	4 2	
3. Communication Address Low	☐	☒			0 [#]
Example: address low=8, address high=11,					1
Resultant address: 118					2
Maximum address: 149					3
					4
					5
					6
					7
					8
					9
4. Communication Address High	☒	☒			0 [#]
	☐	☐			1
					2
					3
					4
					5
					6
					7
					8
					9
					10
					11
					12
					13
					14

Table 4.2

* Individual Window settings

Default value

4.4 Configuration via ANTools

ANTools is an easy to use PC Windows based software for configuring AN1xx series Annunciator settings.

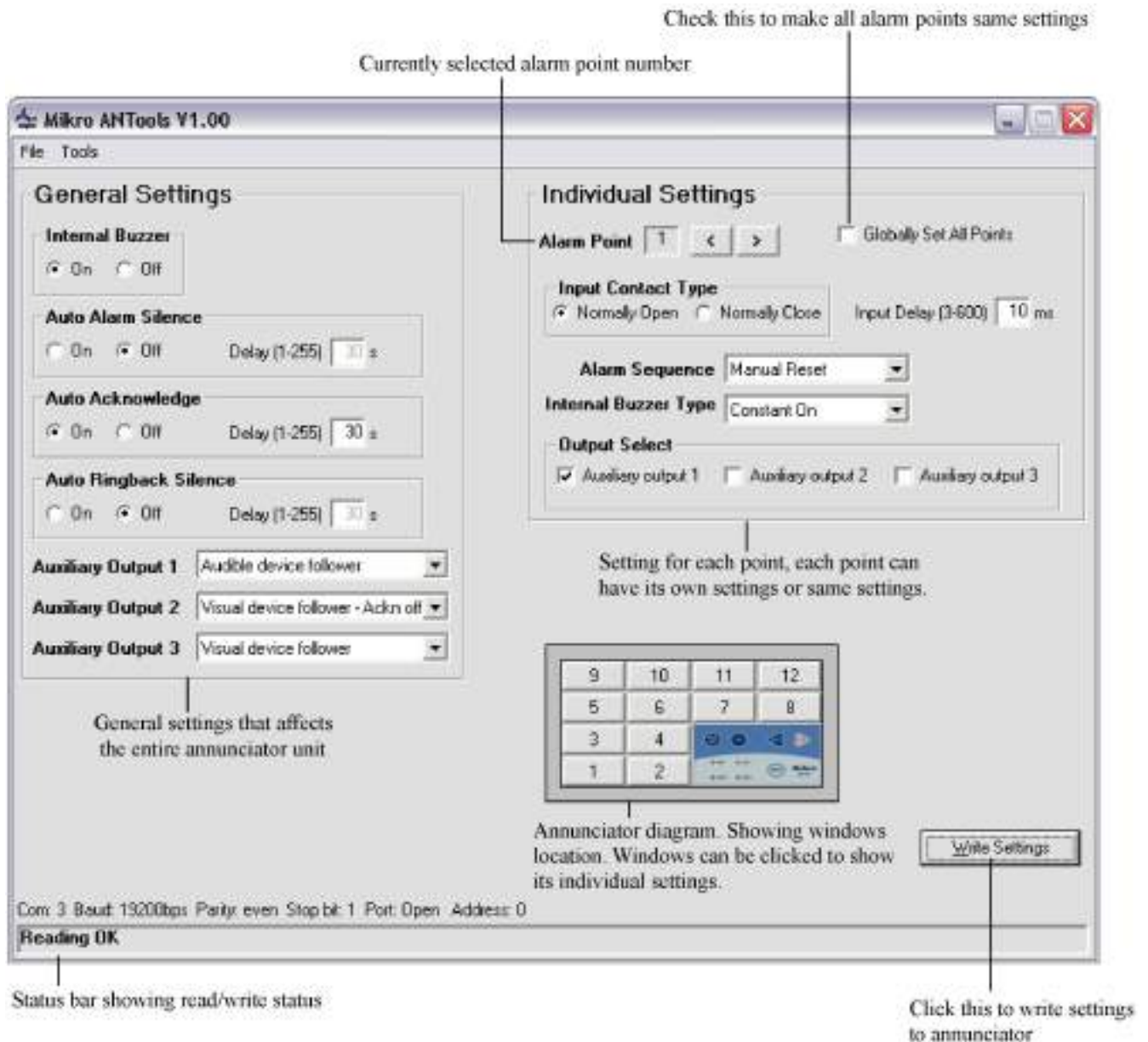


Figure 4.3: Main screen of ANTools.

4.4.1 Installation

Installation is straight forward. Just run the setup.bat. Then create a shortcut to c:\program files\ANTools\ANTools.exe to desired location (Eg: Desktop). Double click the shortcut to run.

4.4.2 Start Up

Upon starting up, ANTools will try to communicate with annunciator on the COM port. Make sure that the Annunciator is power up and connected to the PC. The status bar will show "Reading Settings OK" if reading is successful. Error messages will shown if ANTools failed to communicate with annunciator. Please see *Section 4.4.5 Error Messengers* for more detail.

4.4.3 Communication Settings

Communication settings on ANTools must be the SAME as the annunciator for proper communication.

Use Tools-->Communication Settings... to open the dialogue box.

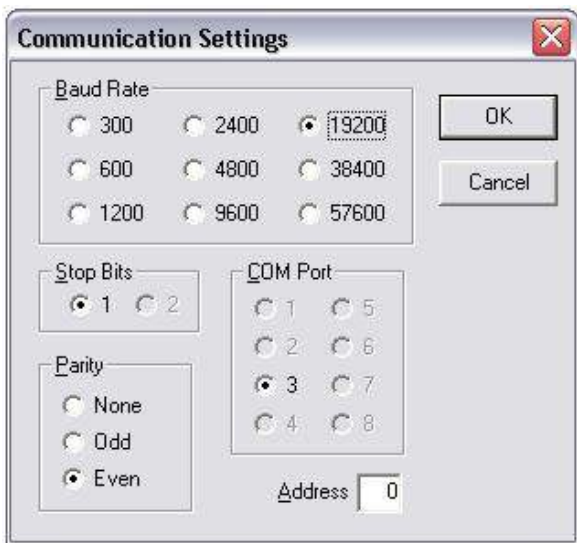


Figure 4.4: Communication Settings dialogue box.

Baud Rate. This is the speed of the communication in bit per second (bps).

Stop Bits. This is the number of bits at the end of data stream.

Parity. This is the error checking method of the data stream.

Com Port. This is the Communication Port (COM port) that connecting PC and Annunciator. Only available ports are shown.

Address. This is the Modbus address of the annunciator.

Select the appropriate settings as required and click **OK** to save and return. Click **Cancel** to return without save.

Communication settings on the annunciator can be set via Pushbuttons. Please refer to *Section 4.3.2 Communication Settings*.

4.4.4 Menu Items

There are 2 menus, File menu and Tools menu.

File Menu Items

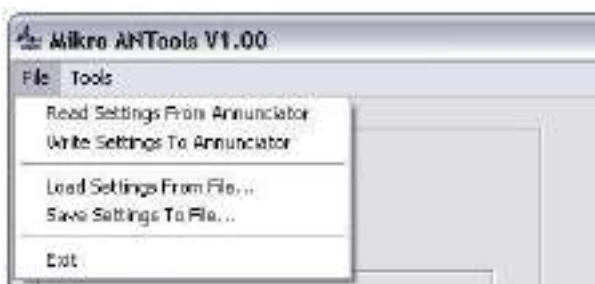


Figure 4.5: File Menu items

File --> Read Settings From Annunciator.

This will read the settings from connected annunciator. Normally ANTools already read from annunciator upon starting up. This function is useful if the user wants to override any changes that has been made on ANTools to settings from annunciator.

File --> Write Settings To Annunciator.

This is the same as the **Write Settings** button on the bottom right. This will write the settings on the ANTools on the screen to the connected annunciator.

File --> Load Settings From File...

This will open the Load Settings dialogue box. A annunciator settings file that has been saved can be loaded as current ANTools settings.

File --> Save Settings From File...

This will open the Save Settings dialogue box. The current settings of ANTools on the screen can be written to a annunciator settings file.

Tools Menu Items

Figure 4.6: Tools Menu items

Tools --> Communication Settings...

This will open the Communication Settings dialogue box. Refer to 4.4.3 *Communication Settings*.

Tools --> Show Communication Settings

This is a menu that once enable, ANTools will show the communicating settings on the line above Status Bar.

Tools --> Port Open

This is a menu that will show the Open/close status of the communication port (COM port). Normally this is automatically checked if the COM port is valid and not opened by another program. Only click this to close the COM port if required by another program. COM port is automatically opened if Writing or Reading of settings are performed.

Tools --> About ANTools...

This will open the About ANTools dialogue box to show the general information of the software and the connected annunciator.

4.4.5 Error Messengers

Some of the error messengers shown on the Status Bar are listed below. Error Message is shown in red colour. Most of the error messengers are related to communication problems.

'Communication Error. Using Default Value. Please Check Communication Settings.' - This is shown only during start up.

Make sure that the annunciator is powered up and connected to the PC.

Make sure that the communication settings of the annunciator is the same as ANTools.

If a error message popped up during start up before the Status Bar showing error, that could mean COM port is either opened by another program, or invalid COM port selected, or other COM port error.

'Write to Annunciator Error' / 'Reading Error' - Also communication related error. Please refer to above for solution.

5.0 Technical Data

5.1 General and Electrical

Window

Window Dimension:	50X30mm.
Type:	White translucent lens.
Colours	Red, Amber. Coloured by field replaceable LED module.
Windows Flash	Fast: 1.4Hz (0.4s on, 0.4s off), Slow: 0.45Hz (1.1s on, 1.1s off). Intermittent: 0.4s on, 1.8s off)

Alarm Sequences	M, A, R, R-12, F1A, F1M, F2A, F2M, F3A, F3M, Follower
------------------------	---

Type of Mounting	Panel Mounting
-------------------------	----------------

Auxiliary Power Input

Fuse protected.	
AN1xx-30	24-36VDC or 18-27VAC.
AN1xx-110	88-132VDC or 64-95VAC.
Power consumption	AN112: 6W. AN120: 8W

Alarm Contact Inputs

Opto-isolated inputs.	
AN1xx-30	24-36VDC or 18-27VAC.
AN1xx-110	88-132VDC or 64-95VAC.
Input current	3mA typical

Relay Outputs

Repeat relays	Potential free for each alarm point. 5A at 250 VAC, 3A at 30VDC. Resistive load.
AUX1-AUX3, RBACK, SSP	5A at 250 VAC, 5A at 30VDC. Resistive load.

Terminals

Wire size	28-14AWG. (0.08mm ² to 2.5mm ²)
Removable screw type terminal block (removable)	

Environment

Operation temperature	-20 to 60°C
Storage temperature	-20 to 80°C
Humidity	0-95% RH, non condensing

Communication

Hardware interface	AN1xx-xx-x-A: RS232 AN1xx-xx-x-B: Isolated RS485
Protocol	Modbus-RTU
Baud rate	300 to 57600

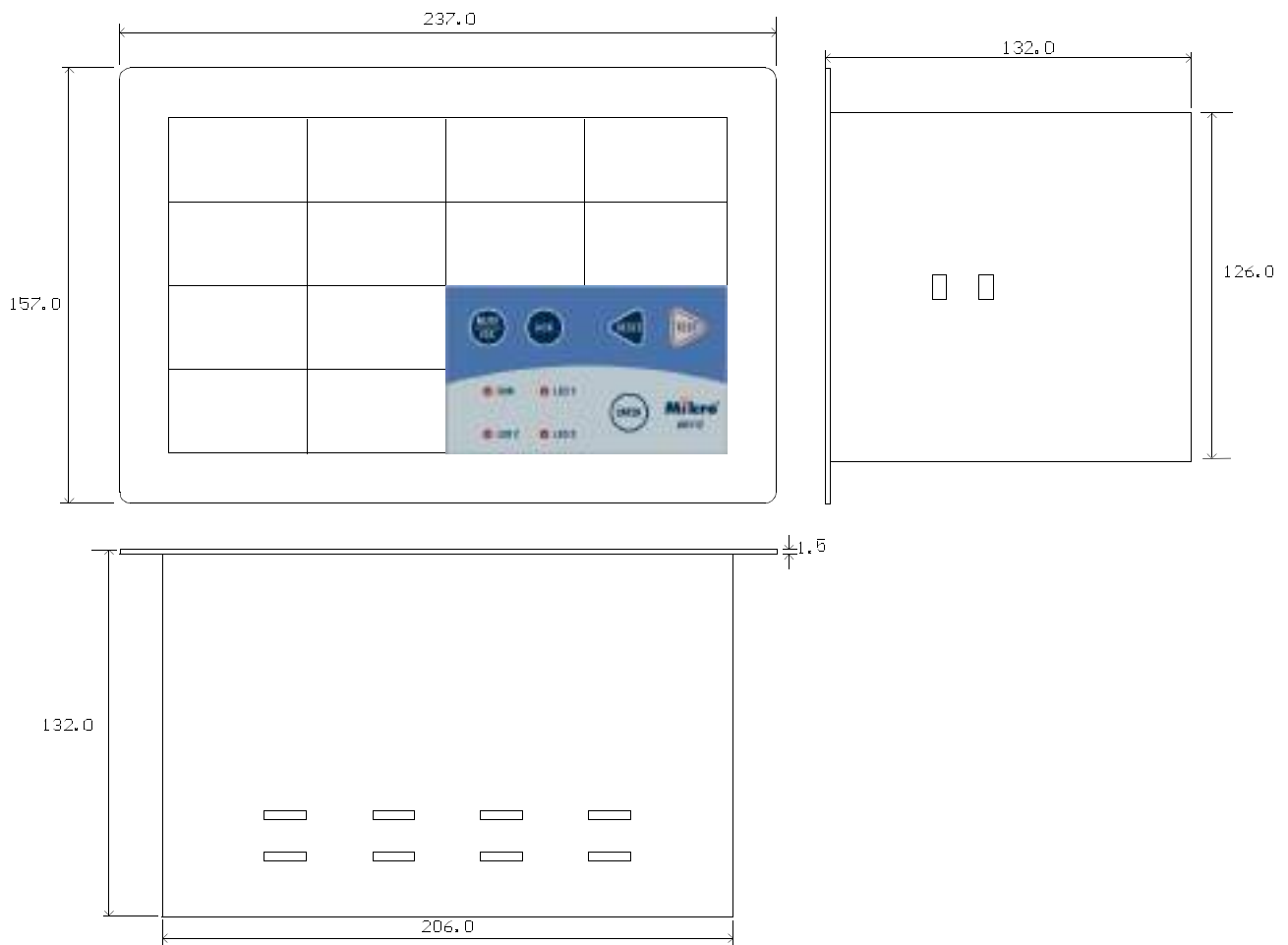
Product Approvals

Electrostatic discharge IEC61000-4-2, Class III, air discharge	8kV
Electrostatic discharge IEC61000-4-2, Class III, contact discharge	6kV
Electrical fast transient IEC61000-4-4, 4kV, 5/50ns	
Surge immunity IEC61000-4-5, 4kV, L to E	
Enclosure protection when panel mounted, Front:	IP41. Enclosure: IP30

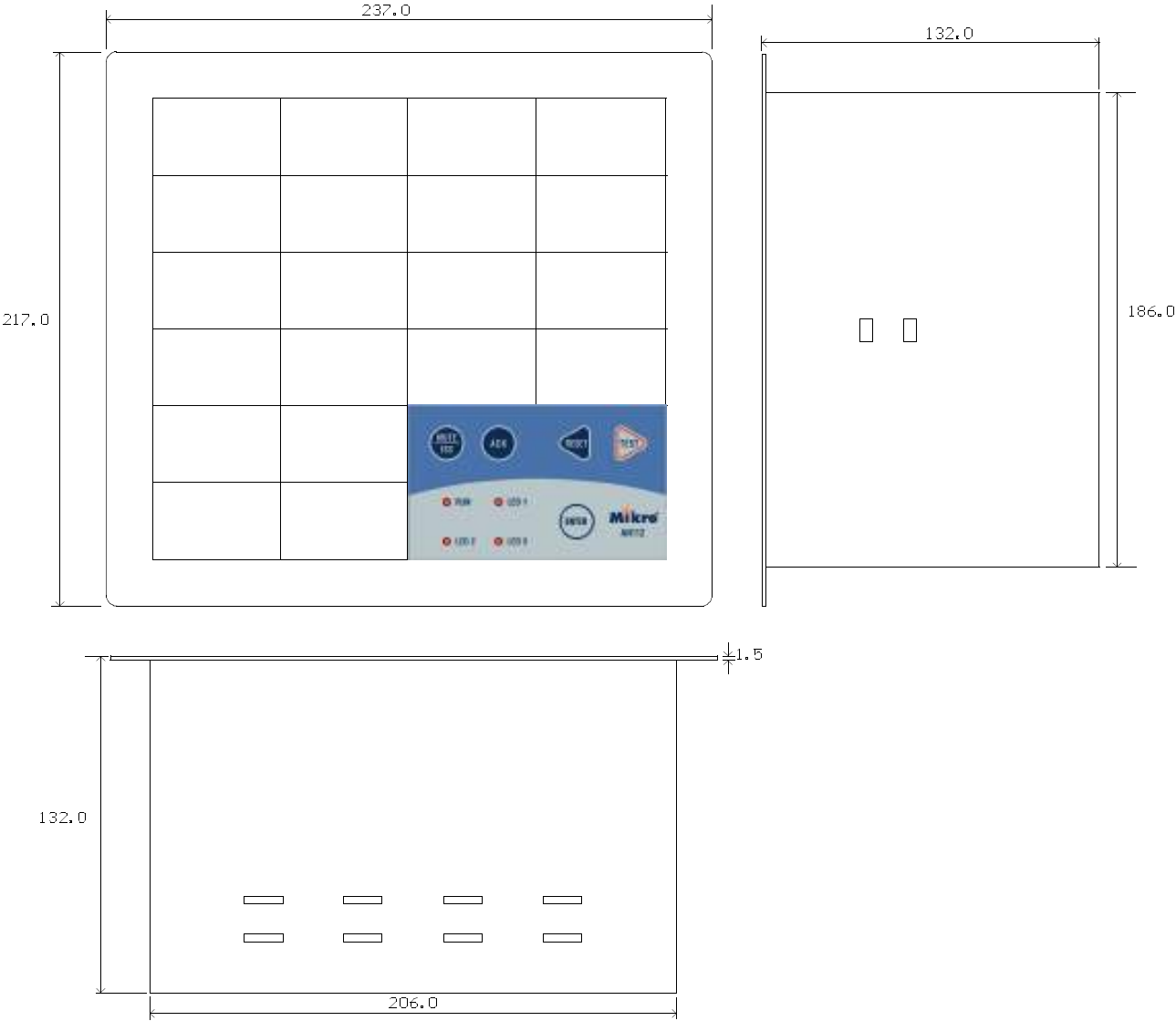
5.2 Dimensions

All dimensions in mm.

5.2.1 AN112



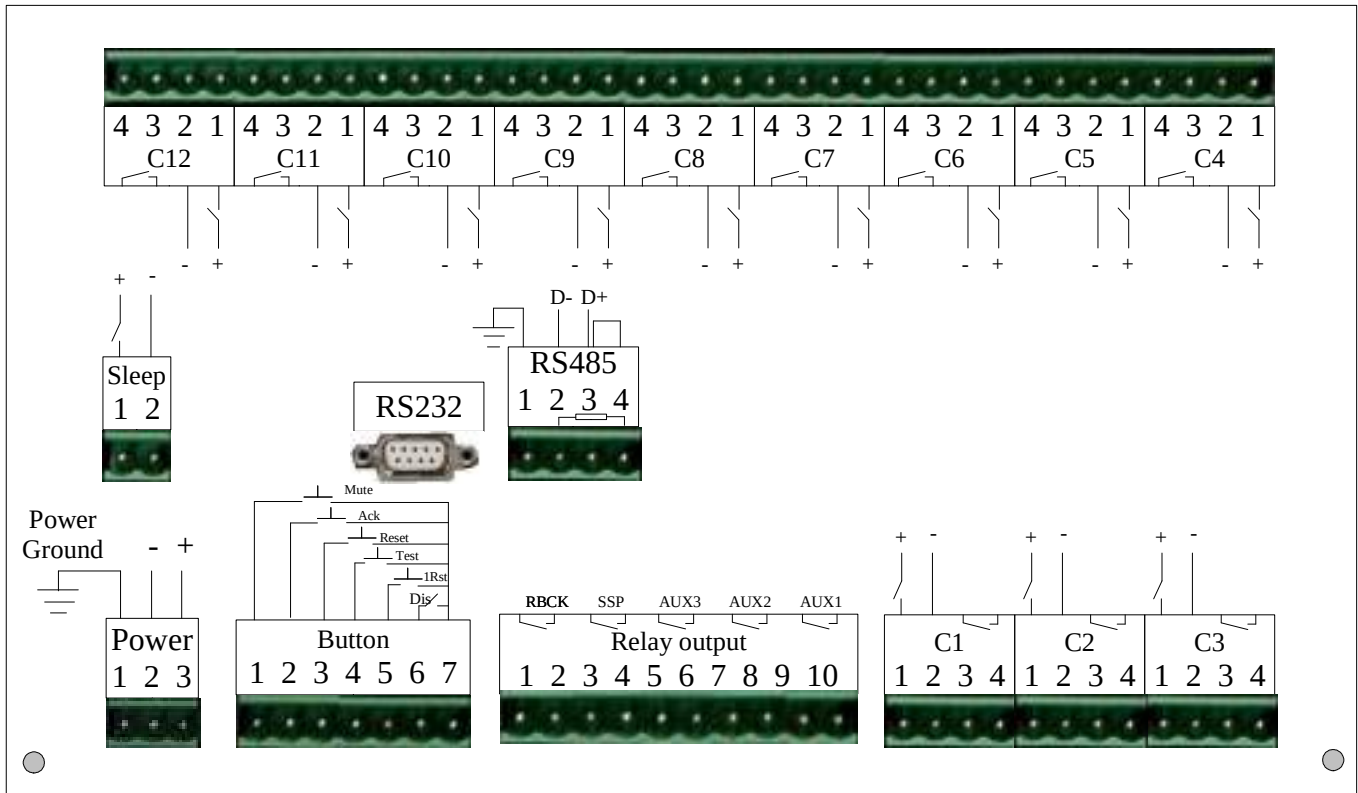
5.2.2 AN120



5.3 Connection Diagram

5.3.1 AN112 With Repeat Relay

(Either RS232 or RS485 is available)



Connector Identification

Connector	Pin	Function
Power	1	Power Earth
	2	-Vdc (Voltage is model dependent)
	3	+Vdc (Voltage is model dependent)
Button	1	Mute
	2	Acknowledge
	3	Reset
	4	Test
	5	First out reset
	6	Front panel button disable
	7	Common return for all buttons
Relay Output	1	Ringback (common)
	2	Ringback (NO)
	3	Self supervisory (common)
	4	Self supervisory (NO)
	5	Auxiliary 3 (common)
	6	Auxiliary 3 (NO)
	7	Auxiliary 2 (common)
	8	Auxiliary 2 (NO)

Connector	Pin	Function
	9	Auxiliary 1 (common)
	10	Auxiliary 1 (NO)
RS232	2	RX (connects to Pin 2 of PC/Master)
(Availability is model dependent)	3	TX (connects to Pin 3 of PC/Master)
	5	GND (connects to Pin 5 of PC/Master)
	7	RTS (connects to Pin 7 of PC/Master)
RS485	1	GND
(Availability is model dependent)	2	RX
	3	TX
	4	120Ω Loop terminate (Short 4 to 3 to enable)
Sleep	1	Sleep input (+) *
	2	Sleep input (-)
C1	1	Alarm Point 1 Input (+) *
	2	Alarm Point 1 Input (-)
	3	Repeat Relay 1 (common)
	4	Repeat Relay 1 (NO)
C2	1	Alarm Point 2 Input (+)
	2	Alarm Point 2 Input (-)
	3	Repeat Relay 2 (common)
	4	Repeat Relay 2 (NO)
C3	1	Alarm Point 3 Input (+)
	2	Alarm Point 3 Input (-)
	3	Repeat Relay 3 (common)
	4	Repeat Relay 3 (NO)
C4	1	Alarm Point 4 Input (+)
	2	Alarm Point 4 Input (-)
	3	Repeat Relay 4 (common)
	4	Repeat Relay 4 (NO)
C5	1	Alarm Point 5 Input (+)
	2	Alarm Point 5 Input (-)
	3	Repeat Relay 5 (common)
	4	Repeat Relay 5 (NO)
C6	1	Alarm Point 6 Input (+)
	2	Alarm Point 6 Input (-)
	3	Repeat Relay 6 (common)
	4	Repeat Relay 6 (NO)
C7	1	Alarm Point 7 Input (+)
	2	Alarm Point 7 Input (-)
	3	Repeat Relay 7 (common)
	4	Repeat Relay 7 (NO)

Connector	Pin	Function
C8	1	Alarm Point 8 Input (+)
	2	Alarm Point 8 Input (-)
	3	Repeat Relay 8 (common)
	4	Repeat Relay 8 (NO)
C9	1	Alarm Point 9 Input (+)
	2	Alarm Point 9 Input (-)
	3	Repeat Relay 9 (common)
	4	Repeat Relay 9 (NO)
C10	1	Alarm Point 10 Input (+)
	2	Alarm Point 10 Input (-)
	3	Repeat Relay 10 (common)
	4	Repeat Relay 10 (NO)
C11	1	Alarm Point 11 Input (+)
	2	Alarm Point 11 Input (-)
	3	Repeat Relay 11 (common)
	4	Repeat Relay 11 (NO)
C12	1	Alarm Point 12 Input (+)
	2	Alarm Point 12 Input (-)
	3	Repeat Relay 12 (common)
	4	Repeat Relay 12 (NO)

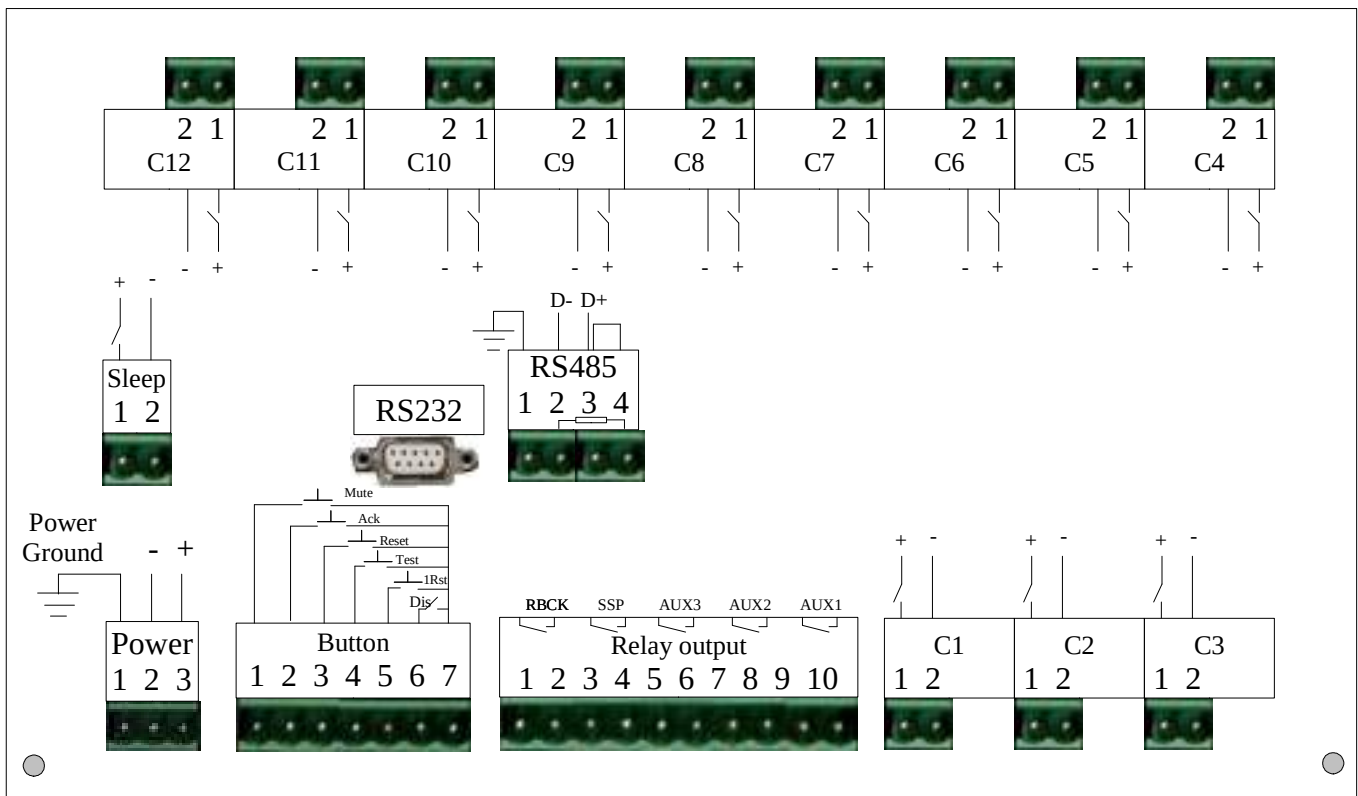
* Sleep and C1-C12 Input voltage rating should be same as Power input.

5.3.2 AN120 With Repeat Relay

See 5.3.1 *AN112 With Repeat Relay* for connection of AN120. AN120 has extra **C13** to **C20** inputs. The pin assignment and connection is similar to C1 to C12.

5.3.3 AN112 Without Repeat Relays

(Either RS232 or RS485 is available)



Connector Identification

Connector	Pin	Function
Power	1	Power Earth
	2	-Vdc (Voltage is model dependent)
	3	+Vdc (Voltage is model dependent)
Button	1	Mute
	2	Acknowledge
	3	Reset
	4	Test
	5	First out reset
	6	Front panel button disable
	7	Common return for all buttons
Relay Output	1	Ringback (common)
	2	Ringback (NO)
	3	Self supervisory (common)
	4	Self supervisory (NO)
	5	Auxiliary 3 (common)
	6	Auxiliary 3 (NO)
	7	Auxiliary 2 (common)
	8	Auxiliary 2 (NO)
	9	Auxiliary 1 (common)
	10	Auxiliary 1 (NO)

Connector	Pin	Function
RS232	2	RX
(Availability is model dependent)	3	TX
	5	GND
	7	RTS
RS485	1	GND
(Availability is model dependent)	2	RX
	3	TX
	4	120Ω Loop terminate (Short 4 to 3 to enable)
Sleep	1	Sleep input (+) *
	2	Sleep input (-)
C1	1	Alarm Point 1 Input (+) *
	2	Alarm Point 1 Input (-)
C2	1	Alarm Point 2 Input (+)
	2	Alarm Point 2 Input (-)
C3	1	Alarm Point 3 Input (+)
	2	Alarm Point 3 Input (-)
C4	1	Alarm Point 4 Input (+)
	2	Alarm Point 4 Input (-)
C5	1	Alarm Point 5 Input (+)
	2	Alarm Point 5 Input (-)
C6	1	Alarm Point 6 Input (+)
	2	Alarm Point 6 Input (-)
C7	1	Alarm Point 7 Input (+)
	2	Alarm Point 7 Input (-)
C8	1	Alarm Point 8 Input (+)
	2	Alarm Point 8 Input (-)
C9	1	Alarm Point 9 Input (+)
	2	Alarm Point 9 Input (-)
C10	1	Alarm Point 10 Input (+)
	2	Alarm Point 10 Input (-)
C11	1	Alarm Point 11 Input (+)
	2	Alarm Point 11 Input (-)
C12	1	Alarm Point 12 Input (+)
	2	Alarm Point 12 Input (-)

* Sleep and C1-C12 Input voltage rating should be same as Power input.

5.3.4 AN120 Without Repeat Relay

See 5.3.3 *AN112 Without Repeat Relay* for connection of AN120. AN120 has extra **C13 to C20** inputs. The pin assignment and connection is similar to C1 to C12.

6.0 Modbus-RTU

6.1 Modbus Protocol

The format used is Modbus RTU mode, selectable baud rate, parity bit and stop bits. (See 4.3.2 *Communication Settings*). RS485 or RS232 communication is dependent on hardware option. The acceptable Modbus commands are shown below:

0x03/0x04 Read Input/Holding Registers

These 2 commands have the same function on the Annunciator

Request	Communication address	1 byte	0 to 149
	Function code	1 byte	0x03/0x04
	Starting Address	2 bytes	0x0000 to 0xFFFF
	Quantity of Registers	2 bytes	0x0001 to 0x0020 (N)
	CRC	2 bytes	2 bytes CRC

Response	Communication address	1 byte	0 to 149
	Function code	1 byte	0x03/0x04
	Byte count	1 byte	2 X N
	Register value	N X 2 bytes	Value
	CRC	2 bytes	2 bytes CRC

Error	Communication address	1 byte	0 to 149
	Error code	1 byte	0x83/0x84
	Exception code	1 byte	0x01 or 02 or 03 or 04
	CRC	2 bytes	2 bytes CRC

0x06 Write Single Register

Request	Communication address	1 byte	0 to 149
	Function code	1 byte	0x06
	Register Address	2 bytes	0x0000 to 0xFFFF
	Register value	2 bytes	Value
	CRC	2 bytes	2 bytes CRC

Response	Communication address	1 byte	0 to 149
	Function code	1 byte	0x06
	Register value	2 bytes	0x0000 to 0xFFFF
	CRC	2 bytes	2 bytes CRC

Error	Communication address	1 byte	0 to 149
	Error code	1 byte	0x86
	Exception code	1 byte	0x01 or 02 or 03 or 04
	CRC	2 bytes	2 bytes CRC

0x10 Write Multiple Registers

Request	Communication address	1 byte	0 to 149
	Function code	1 byte	0x10
	Starting Address	2 bytes	0x0000 to 0xFFFF
	Quantity of Registers	2 bytes	0x0001 to 0x0020 (N)
	Byte count	1 byte	2 X N
	Register value	N X 2 bytes	Value
	CRC	2 bytes	2 bytes CRC

Response	Communication address	1 byte	0 to 149
	Function code	1 byte	0x10
	Quantity of Registers	2 bytes	No of words (N)
	CRC	2 bytes	2 bytes CRC

Error	Communication address	1 byte	0 to 149
	Error code	1 byte	0x90
	Exception code	1 byte	0x01 or 02 or 03 or 04
	CRC	2 bytes	2 bytes CRC

6.2 Modbus RTU Table

Address		Parameter	Format	General description
Dec	Hex			
Read only		Product information		Function 0x03 or 0x04
0	0	Model description 1 & 2	F10	'AN'
1	0001	Model description 3 & 4	F10	'1x' (x=number of windows high digit)
2	0002	Model description 5 & 6	F10	'yz' (y=number of windows low digit, z=reserved)
3	0003	Manufacturer 1 & 2	F10	'MI'
4	0004	Manufacturer 3 & 4	F10	'KR'
5	0005	Manufacturer 5 & 6	F10	'O' ' ' ' '
6	0006	Firmware version	F10	'xx' (x.x)
7	0007	Number of windows	F10	'xx'
Read only		System Status		Function 0x03 or 0x04
16	0010	Window 1 & 2 status	F11	Window off, on, slow, fast, intermittent blink
17	0011	Window 3 & 4 status	F11	
18	0012	Window 5 & 6 status	F11	
19	0013	Window 7 & 8 status	F11	
20	0014	Window 9 & 10 status	F11	
21	0015	Window 11 & 12 status	F11	
22	0016	Window 13 & 14 status	F11	
23	0017	Window 15 & 16 status	F11	
24	0018	Window 17 & 18 status	F11	
25	0019	Window 19 & 20 status	F11	
26	001A	Window 21 & 22 status	F11	
27	001B	Window 23 & 24 status	F11	
28	001C	Window 25 & 26 status	F11	
29	001D	Window 27 & 28 status	F11	
30	001E	Window 29 & 30 status	F11	
31	001F	Window 31 & 32 status	F11	
32	0020	Window 33 & 34 status	F11	
33	0021	Window 35 & 36 status	F11	
34	0022	Window 37 & 38 status	F11	
35	0023	Window 39 & 40 status	F11	
36	0024	Window 41 & 42 status	F11	
37	0025	Window 43 & 44 status	F11	
38	0026	Window 45 & 46 status	F11	
39	0027	Window 47 & 48 status	F11	
40	0028	Window 49 & 50 status	F11	
41	0029	Window 51 & 52 status	F11	
42	002A	Window 53 & 54 status	F11	
43	002B	Window 55 & 56 status	F11	
44	002C	Window 57 & 58 status	F11	
45	002D	Window 59 & 60 status	F11	
46	002E	Window 61 & 62 status	F11	
47	002F	Window 63 & 64 status	F11	
160	00A0	Alarm point input 1 - 16 status	F19	
161	00A1	Alarm point input 17 - 32 status	F19	
162	00A2	Alarm point input 33 - 48 status	F19	
163	00A3	Alarm point input 49 - 64 status	F19	
176	00B0	Buzzer & output relay status	F12	
Write only		Remote command		Function 0x06
256	0100	Button command	F13	Mute, ack, reset, first reset

Read/Write		Parameter setting		Function 0x03,0x04, 0x06, or 0x10
4096	1000	Alarm point 1 setting 1	F14	NO/NC, sequences, buzzer type, output select Input delay time
4097	1001	Alarm point 1 setting 2	F15	
4098	1002	Alarm point 2 setting 1	F14	
4099	1003	Alarm point 2 setting 2	F15	
4100	1004	Alarm point 3 setting 1	F14	
4101	1005	Alarm point 3 setting 2	F15	
4102	1006	Alarm point 4 setting 1	F14	
4103	1007	Alarm point 4 setting 2	F15	
4104	1008	Alarm point 5 setting 1	F14	
4105	1009	Alarm point 5 setting 2	F15	
4106	100A	Alarm point 6 setting 1	F14	
4107	100B	Alarm point 6 setting 2	F15	
4108	100C	Alarm point 7 setting 1	F14	
4109	100D	Alarm point 7 setting 2	F15	
4110	100E	Alarm point 8 setting 1	F14	
4111	100F	Alarm point 8 setting 2	F15	
4112	1010	Alarm point 9 setting 1	F14	
4113	1011	Alarm point 9 setting 2	F15	
4114	1012	Alarm point 10 setting 1	F14	
4115	1013	Alarm point 10 setting 2	F15	
4116	1014	Alarm point 11 setting 1	F14	
4117	1015	Alarm point 11 setting 2	F15	
4118	1016	Alarm point 12 setting 1	F14	
4119	1017	Alarm point 12 setting 2	F15	
4120	1018	Alarm point 13 setting 1	F14	
4121	1019	Alarm point 13 setting 2	F15	
4122	101A	Alarm point 14 setting 1	F14	
4123	101B	Alarm point 14 setting 2	F15	
4124	101C	Alarm point 15 setting 1	F14	
4125	101D	Alarm point 15 setting 2	F15	
4126	101E	Alarm point 16 setting 1	F14	
4127	101F	Alarm point 16 setting 2	F15	
4128	1020	Alarm point 17 setting 1	F14	
4129	1021	Alarm point 17 setting 2	F15	
4130	1022	Alarm point 18 setting 1	F14	
4131	1023	Alarm point 18 setting 2	F15	
4132	1024	Alarm point 19 setting 1	F14	
4133	1025	Alarm point 19 setting 2	F15	
4134	1026	Alarm point 20 setting 1	F14	
4135	1027	Alarm point 20 setting 2	F15	
4136	1028	Alarm point 21 setting 1	F14	
4137	1029	Alarm point 21 setting 2	F15	
4138	102A	Alarm point 22 setting 1	F14	
4139	102B	Alarm point 22 setting 2	F15	
4140	102C	Alarm point 23 setting 1	F14	
4141	102D	Alarm point 23 setting 2	F15	
4142	102E	Alarm point 24 setting 1	F14	
4143	102F	Alarm point 24 setting 2	F15	
4144	1030	Alarm point 25 setting 1	F14	
4145	1031	Alarm point 25 setting 2	F15	
4146	1032	Alarm point 26 setting 1	F14	
4147	1033	Alarm point 26 setting 2	F15	
4148	1034	Alarm point 27 setting 1	F14	
4149	1035	Alarm point 27 setting 2	F15	
4150	1036	Alarm point 28 setting 1	F14	
4151	1037	Alarm point 28 setting 2	F15	
4152	1038	Alarm point 29 setting 1	F14	
4153	1039	Alarm point 29 setting 2	F15	
4154	103A	Alarm point 30 setting 1	F14	
4155	103B	Alarm point 30 setting 2	F15	
4156	103C	Alarm point 31 setting 1	F14	
4157	103D	Alarm point 31 setting 2	F15	
4158	103E	Alarm point 32 setting 1	F14	
4159	103F	Alarm point 32 setting 2	F15	
4160	1040	Alarm point 33 setting 1	F14	
4161	1041	Alarm point 33 setting 2	F15	

4162	1042	Alarm point 34 setting 1	F14	
4163	1043	Alarm point 34 setting 2	F15	
4164	1044	Alarm point 35 setting 1	F14	
4165	1045	Alarm point 35 setting 2	F15	
4166	1046	Alarm point 36 setting 1	F14	
4167	1047	Alarm point 36 setting 2	F15	
4168	1048	Alarm point 37 setting 1	F14	
4169	1049	Alarm point 37 setting 2	F15	
4170	104A	Alarm point 38 setting 1	F14	
4171	104B	Alarm point 38 setting 2	F15	
4172	104C	Alarm point 39 setting 1	F14	
4173	104D	Alarm point 39 setting 2	F15	
4174	104E	Alarm point 40 setting 1	F14	
4175	104F	Alarm point 40 setting 2	F15	
4176	1050	Alarm point 41 setting 1	F14	
4177	1051	Alarm point 41 setting 2	F15	
4178	1052	Alarm point 42 setting 1	F14	
4179	1053	Alarm point 42 setting 2	F15	
4180	1054	Alarm point 43 setting 1	F14	
4181	1055	Alarm point 43 setting 2	F15	
4182	1056	Alarm point 44 setting 1	F14	
4183	1057	Alarm point 44 setting 2	F15	
4184	1058	Alarm point 45 setting 1	F14	
4185	1059	Alarm point 45 setting 2	F15	
4186	105A	Alarm point 46 setting 1	F14	
4187	105B	Alarm point 46 setting 2	F15	
4188	105C	Alarm point 47 setting 1	F14	
4189	105D	Alarm point 47 setting 2	F15	
4190	105E	Alarm point 48 setting 1	F14	
4191	105F	Alarm point 48 setting 2	F15	
4192	1060	Alarm point 49 setting 1	F14	
4193	1061	Alarm point 49 setting 2	F15	
4194	1062	Alarm point 50 setting 1	F14	
4195	1063	Alarm point 50 setting 2	F15	
4196	1064	Alarm point 51 setting 1	F14	
4197	1065	Alarm point 51 setting 2	F15	
4198	1066	Alarm point 52 setting 1	F14	
4199	1067	Alarm point 52 setting 2	F15	
4200	1068	Alarm point 53 setting 1	F14	
4201	1069	Alarm point 53 setting 2	F15	
4202	106A	Alarm point 54 setting 1	F14	
4203	106B	Alarm point 54 setting 2	F15	
4204	106C	Alarm point 55 setting 1	F14	
4205	106D	Alarm point 55 setting 2	F15	
4206	106E	Alarm point 56 setting 1	F14	
4207	106F	Alarm point 56 setting 2	F15	
4208	1070	Alarm point 57 setting 1	F14	
4209	1071	Alarm point 57 setting 2	F15	
4210	1072	Alarm point 58 setting 1	F14	
4211	1073	Alarm point 58 setting 2	F15	
4212	1074	Alarm point 59 setting 1	F14	
4213	1075	Alarm point 59 setting 2	F15	
4214	1076	Alarm point 60 setting 1	F14	
4215	1077	Alarm point 60 setting 2	F15	
4216	1078	Alarm point 61 setting 1	F14	
4217	1079	Alarm point 61 setting 2	F15	
4218	107A	Alarm point 62 setting 1	F14	
4219	107B	Alarm point 62 setting 2	F15	
4220	107C	Alarm point 63 setting 1	F14	
4221	107D	Alarm point 63 setting 2	F15	
4222	107E	Alarm point 64 setting 1	F14	
4223	107F	Alarm point 64 setting 2	F15	
4352	1100	General setting	F16	Low byte: Buzzer, sleep, auto alarm/ringback mute, ack
4353	1101	Aux 1 & aux 2 configuration	F17	High byte: Aux 1, Low byte: Aux 2
4354	1102	Aux 3 configuration	F17	High byte: Aux 3, Low byte: unused
4355	1103	Auto alarm & auto ringback silence time	F18	High byte: alarm, Low byte: ringback
4356	1104	Auto acknowledge time	F18	High byte: auto acknowledge, Low byte: unused

*Read/write of unused or unavailable Window or Alarm point parameter is acceptable but would give unexpected results

6.2.1 Description of Field

Format	Type	Description
F10	Product info	ASCII character
F11	Window status	High byte: even no. window. Low byte: odd no. window 0 = window off 1 = window on 2 = slow flashing 3 = fast flashing 4 = intermittent flashing
F12	Buzzer & output relay status	High byte: Buzzer status 0 = buzzer off 1 = constant on 2 = intermittent 1 (0.9Hz) 3 = intermittent 2 (2.2Hz) Low byte: Output relay status 0' = off, '1' = on Bit 0 – aux1 relay Bit 1 – aux2 relay Bit 2 – aux3 relay Bit 4 – ringback relay Bit 5 – SSP relay
F13	Button command	High byte: 0, Low byte as below: To trigger the respective button. Set '1' to trigger, '0' no action Bit 0 – Mute button Bit 1 – Ack button Bit 2 – Reset button Bit 3 – First up Reset button (only 1 bit set at a time)
F14	Alarm point setting 1	High byte: Bit 0: 0 = NO, 1 = NC Bit 1 – 4: 0000 = Manual reset 0001 = Auto reset 0010 = Ringback 0011 = Ringback with auto acknowledge 0100 = F1M 0101 = F1A 0110 = F2M 0111 = F2A 1000 = F3M 1001 = F3A 1010 = FOLLOWER Bit 5 – 7: Internal buzzer type 000 = off 001 = constant on 010 = intermittent 1 (0.9 Hz) 011 = intermittent 2 (2.2 Hz) Low byte: '1' to select Aux relay Bit 0 – Aux 1 relay selected Bit 1 – Aux 2 relay selected Bit 2 – Aux 3 relay selected
F15	Alarm point setting 2	Input contact delay/confirmation High byte: 0 Low byte: Valid range: 1-255 (x 2.5ms)
F16	General setting	General setting for the annunciator High byte: 0, Low byte as below: Bit 0 – Internal buzzer on/off. '1' = off, '0' = on Bit 1 – sleep mode. '1' = sleep, '0' = normal (read only) Bit 2 – auto alarm silence. '1' = enabled, '0' = disabled Bit 3 – auto ringback silence. '1' = enabled, '0' = disabled Bit 4 – auto acknowledge. '1' = enabled, '0' = disabled
F17	Auxiliary relay configuration	High byte: Aux1 or 3, Low byte: Aux 2 Bit 0 – 3: 0000 = Follow input contact, on = fault, off = normal 0001 = follow input contact, off = fault, on = normal 0010 = On when buzzer on, off after ack 0011 = On when buzzer on, off after mute/ack 0100 = On when buzzer on, off when window is off (normal)
F18	Auto timer setting	1 – 255 second
F19	Alarm point input status	Alarm point input contact status. '0' = normal, '1' = fault. Bit 0 - min input number, bit 15 – max input number