# AES 7094
# IntelliPro

# Installation Manual

Firmware Rev 1.150

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# 1 Summary

This document describes the 7094 installation procedure combined with an AES subscriber (7450, 7788, etc) and the interface to an Alarm Panel (AP) via the dialer interface to the phone line (POTS). The 7094 is installed between the AP and the POTS (POTS optional). When in operation, the 7094 decodes CID, PULSE, or Modem II and Modem III messages on the AP phone interface and sends it via the subscriber radio. It also provides a full replacement to a POTS line, as well as POTS monitoring, if POTS present.

## 1.1 Basic functions

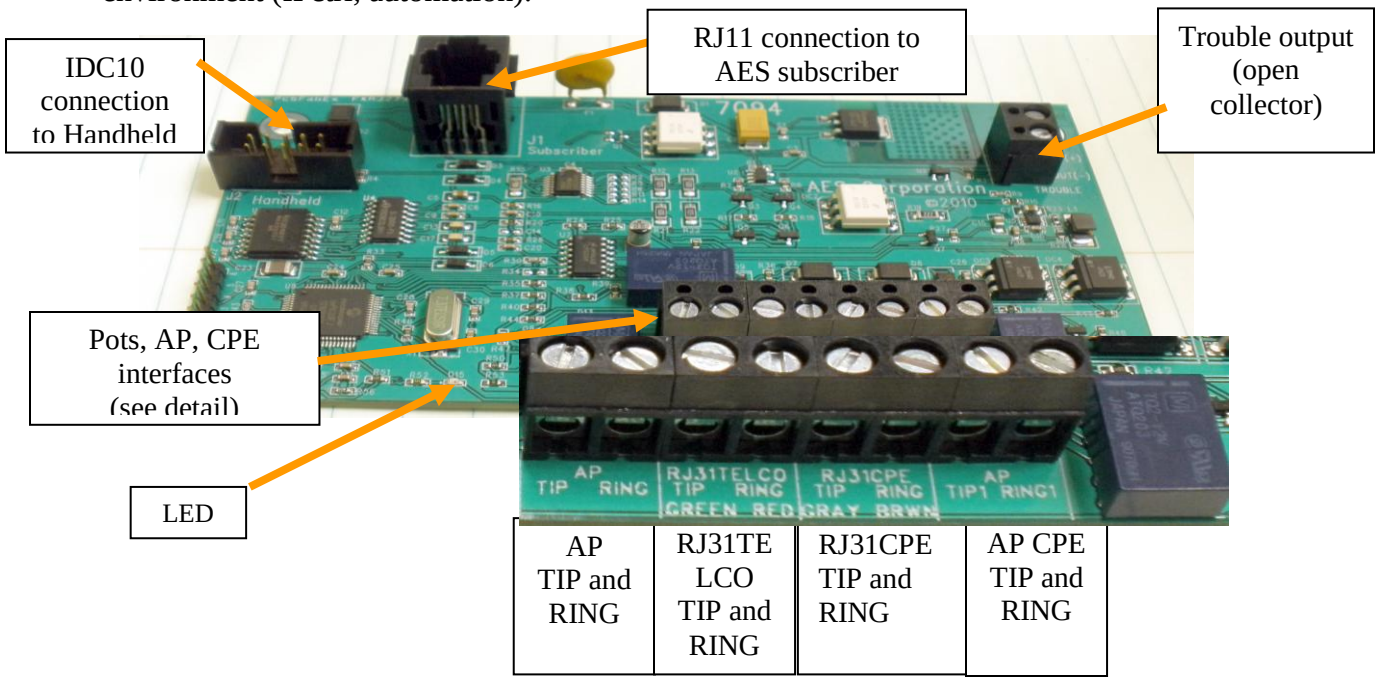
The 7094 is a dialer capture module with monitoring capabilities as well as full emulation of the POTS for incoming data (incoming to the 7094, dialed from the AP). It can operate with or without a phone line, and can monitor the phone line presence as well. It can also intercept the phone line connection at different states of the call, if the intercept number matches the number being dialed.

## 1.2 User interface

The 7094 is programmed using the handheld, and does not have any jumpers.
The handheld connects to the 10-pin header (not the conventional RJ11, that is used only for connecting to the subscriber unit). This allows the usage of the handheld for diagnostic and monitor of the 7094 while in operation. In addition to the handheld port, the 7094 has one LED, to indicate operation and heartbeat.

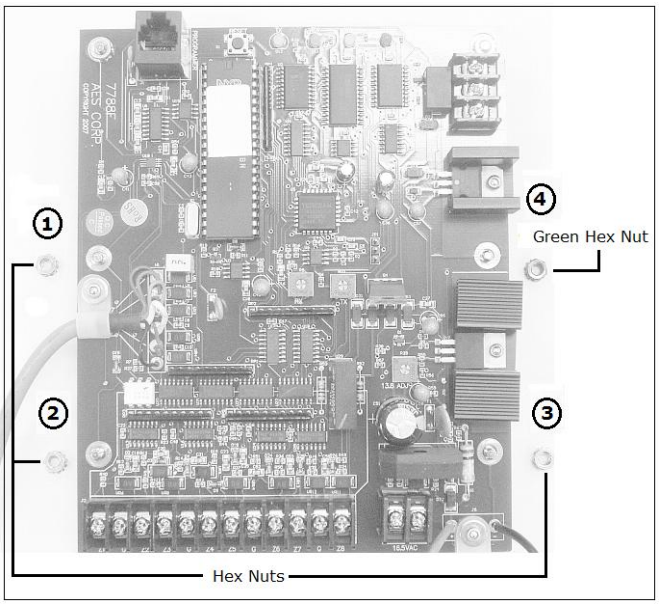
## 1.3 System requirements

This document assumes that the user knows how to set the AES subscriber (account, cipher, zone configuration), and how to operate a functional installation of the Multinet environment (IPctrl, automation).

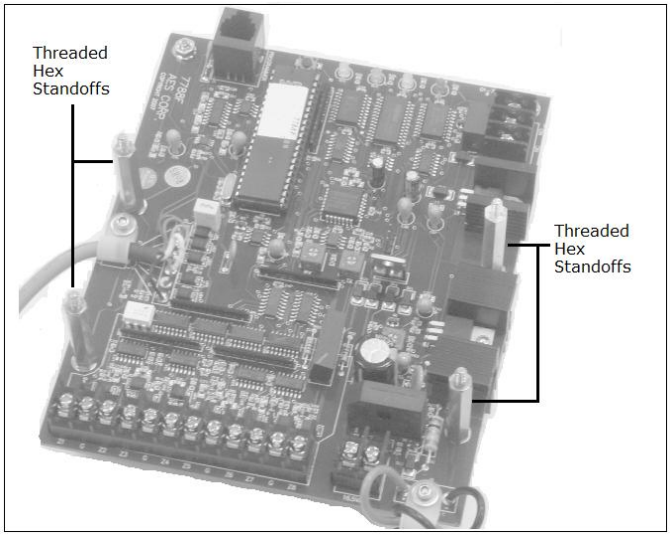


# 2 Installation of 7094 in subscriber unit

- Remove four (4) of the hex nuts shown below that hold the subscriber unit board in the subscriber enclosure. Save the hex nuts.




- Install the 4 hex standoffs (P/N 09-2015). Place the standoffs on the threads exposed after removing the hex nuts. Do not over tighten the standoffs while installing. See below.

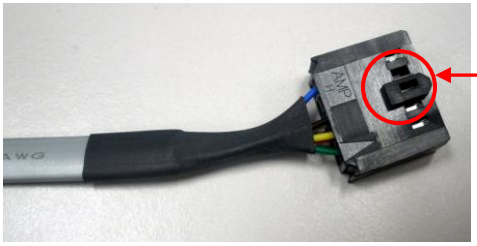



- Mount the 7094 PC board on four newly installed standoffs. Install the insulating washers (P/N 09-7X94) over the H1 and H3 mounting holes. Temporarily secure the board using the 4 hex nuts removed earlier. **Important:** Place the Earth Ground hex nut (green) on the right side center hex standoff as shown above.

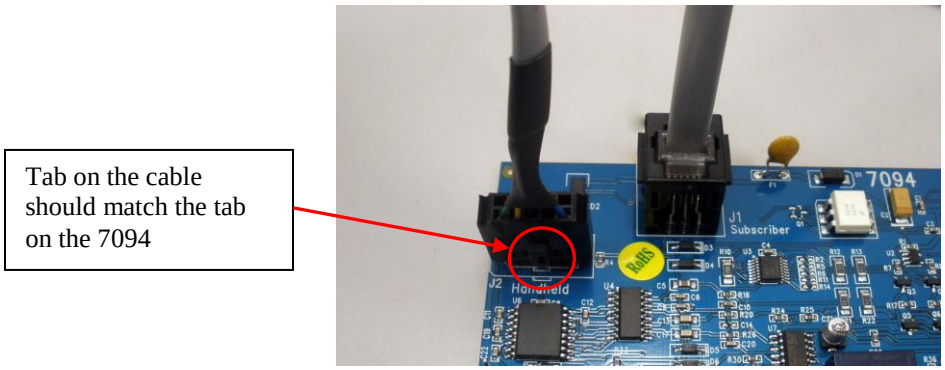
# 3 Connecting the 7094 to the handheld and to the subscriber

## 3.1 Connecting the 7094 to Handheld

In order to configure/program/monitor the 7094 you need the handheld attached to the IDC port (connector J2). Use AES PART # 13-7094 to connect 7094 J2 to the handheld.




Note: Be very careful while inserting the IDC10 cable into the port J2 on the 7094. Make sure that the tab on the connector matches the tab on the J2 port. DO NOT INSERT THE CABLE IN THE WRONG ORIENTATION.




## 3.2 Connecting the 7094 to the AES Subscriber

Connect the RJ11 connector coming from the subscriber to the 7094 connector J1. At this point, if the subscriber is powered, the 7094 will power as well.

# 4 How to find which firmware version is on the 7094

When you power up the 7094 with the handheld connected, the LCD will display

**7094v1.150 F1=config**
**POTS:NO,7094=POTS**

(IN CASE YOU SEE DIFFERENT DATA, OR YOU ONLY SEE SOME "GARBAGE", PRESS F1, THEN "E", TO UPDATE THE DISPLAY. SOME HANDHELDS HAVE A SLOW RESPONSE TIME.)

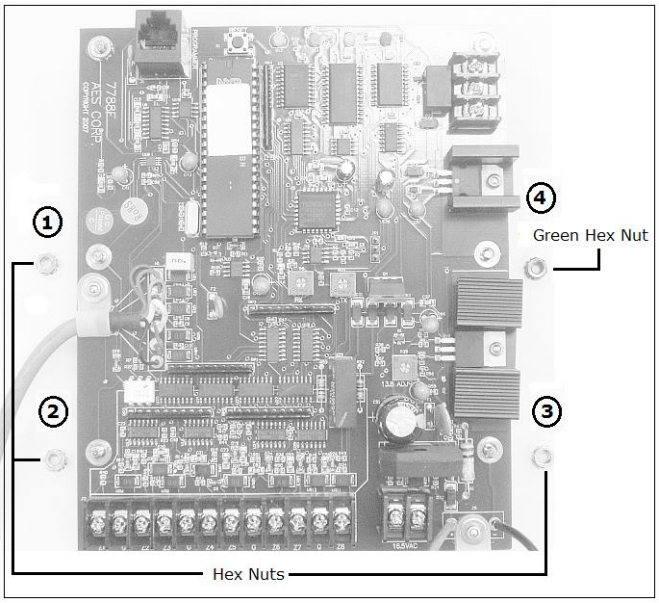
The version is the set of numbers after the letter "v

# 5 Programming the 7094

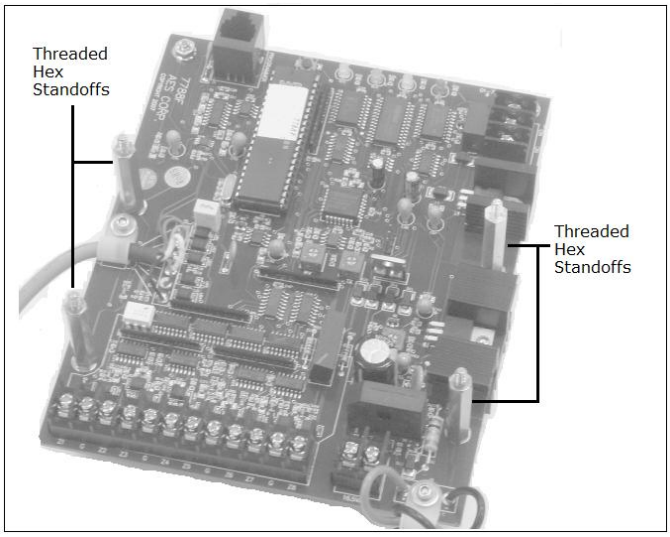
# 6 In order to configure/program/monitor the 7094 IDC port (connector J2). For details, see section 2

## - Installation of 7094 in subscriber unit

- Remove four (4) of the hex nuts shown below that hold the subscriber unit board in the subscriber enclosure. Save the hex nuts.




- Install the 4 hex standoffs (P/N 09-2015). Place the standoffs on the threads exposed after removing the hex nuts. Do not over tighten the standoffs while installing. See below.




- Mount the 7094 PC board on four newly installed standoffs. Install the insulating washers (P/N 09-7X94) over the H1 and H3 mounting holes. Temporarily secure

the board using the 4 hex nuts removed earlier. **Important:** Place the Earth Ground hex nut (green) on the right side center hex standoff as shown above.

Connecting the 7094 to the handheld and to the subscriber, on page 5.

At any time you can press F1 to program the 7094, or E (or ESC) to exit

## 6.1 Default configuration

The 7094 can be configured via the Handheld (or PC terminal) and/or via the IntelliLoader (NOTE: Check Intelliloader version for features that can be programmed via the Intelliloader)

Once configured, this information is stored on the 7094 non-volatile memory, i.e. it will remain configured even if power cycled.

The default settings are:

| **Parameter** | **Default setting** |
|---|---|
| Phone line | No |
| Intercept Number | 555 |
| AP report format | Contact ID (CID) |
| AP Input gain | 10 |
| Intercept on Blind dial | No |
| Line cut Report | Yes |
| POTS cut report delay | 45 sec |
| POTS restoral delay | 60 sec |
| AP ACCT override | No |
| POTS Input Gain | 20 |

## 6.2 Entering the programming mode

From the main screen, press F1. This will place you at the programming mode. The 7094 will still process the events even while in programming mode, and because some of the operations display information on the LCD, you may see different data while programming. It is a good practice to configure it w/o the panel connected to it.

# 7 7094 Programming options

This section will describe how to program the 7094 using the Handheld.

## 7.1 POTS presence

Press F1, and you will see:

```
Config (E to exit)
1: Phone line:
NO
F3:CHG,F4:UP,F5:DOWN
```

Use F3 to change the value, F4 and F5 to browse on the list of programmable features
Press F3 and you will see:

```
Phone line present?
Current: NO
New: [Y/N]
Type Y/N, ESC=exit
```

If you type Y, it will change t

## 7.2 Intercept number

From the CONFIG screen Press F5 to go down, and you will see

```
Config (E to exit)
2: Intercept number:
555
F3:CHG,F4:UP,F5:DOWN
```

Press F3 to enter a phone number, for instance, 123, and press enter

```
Intercept number:
123
Type numb +ENTER/ESC
```

It will change to

```
Config (E to exit)
2: Intercept number:
123
F3:CHG,F4:UP,F5:DOWN
```

Exit with E (for exit) or ESC
The options are:

- <none>: will not intercept any number
- *** (3 asterisks = any number with 3 digits or more)
- any sequence of up to 20 digits

Note: If the line is cut, the 7094 will always handle the dialed number, regardless of the settings on this configuration option.

NOTE: When you change from POTS=YES to POTS=NO, and then return to POTS=YES, you will notice that the intercept number remains unchanged.

## 7.3 Changing Alarm Panel report format

This setting allows you to modify the way the 7094 interprets the data sent by the AP over the phone dialer interface. The 7094 interprets the data and sends it to the Multinet. The 7094 currently supports the following formats:

- Contact ID (Ademco CID)
- Pulse formats at 10 and 20 pulses per second, with combinations of handshake, kiss-off, and center pulse frequencies, plus variable durations that cover most pulse formats
- Modem formats from Bosch, ranging from ModemII to ModemIIIa.

From the CONFIG screen Press F5 to go down until you see

**Config (E to exit)**
**3:AP report format**
**Current: CID**
**F3:CHG,F4:UP,F5:DOWN**

Use F3 to change the value:

**AP Report Format**
**Current: CID**
**CID,MODEM,PULSE**
**Type C/M/P,ESC=exit**

Where,
C= CID
M=MODEM
P=PULSE

### 7.3.1 CID Alarm Format

If you select CID report format by pressing "C", you will be able to see,

**Config (E to exit)**
**3:AP report format**
**Current: CID**
**F3:CHG,F4:UP,F5:DOWN**

For details see item 13 - Format: Contact ID on page 18

### 7.3.2 Modem Alarm format

If you select the Modem report format by pressing "M", and then press F5 to go down, you should be able to see:

**AP FORMAT - MODEM**
**Current: MODEM3**

**F3:CHG,F4:UP,F5:DOWN**

Use F3 to change the value

**AP FORMAT - MODEM**
**Current: MODEM3**
**A=MODEM3,B=MODEM2**
**Type A/B,ESC=exit**

For details see item 14 - Format: Bosch/Radionics Modem 2 and Modem 3 on page 19.

#### 7.3.2.1 Modem 2 format – unknown panel type family assignment

When using the Modem II format, there is a chance that you will find a panel type (a field on the Modem II message that the 7094 translates) that does not exist on the 7094 pre-defined panel types. When that occurs, even though the 7094 knows that it is a Modem II, it cannot decide what is the panel family. For such cases, there is a special setting that only becomes active when the unknown panel type is detected. This only happens at the configuration time, and you MUST set the proper family.
For details, section 14.2 - Modem 2 format – unknown panel type family assignment on page 19

### 7.3.3 Pulse Alarm format

If you select the Pulse report format by pressing "P", and then press F5 to go down, you should be able to see:

```
AP REP FORMAT -PULSE
HSD|HSF|CF  |IDT|IRT
0.8|1.4|1.8|0.7|3.0
Type D,F,C,I,R,esc
```

D=HSD (Handshaking duration)
F=HSF (Handshaking frequency)
C=CF (Center frequency)
I=IDT (Inter digit time)
R=IRT (Inter round time)

If you press D you should see

```
PULSE:HDSKE DURATION
Current: 0.8 seconds
A=0.8,B=0.4
Type A/B, ESC=exit
```

If you press C you should see

```
PULSE:CENTER FREQUE.
Current: 1.8 kHz
A=1.8,B=1.9
Type A/B, ESC=exit
```

If you press F you should see

```
PULSE:HS/KO FREQUEN.
Current: 1.4 kHz
A=1.4,B=2.3
Type A/B, ESC=exit
```

If you press I you should see

```
PULSE:INTER DIGIT TIME
Current: 0.7 seconds
A=0.7,B=0.9,C=1.7
Type A/B/C, ESC=exit
```

If you press R you should see

```
PULSE:INTER ROUND TIME
Current: 3.0 seconds
A=3.0,B=5.0
Type A/B, ESC=exit
```

For details on what each of these parameters means, see item 15 - Format: Pulse, on page 22.

## 7.4 AP Input gain

AP Input gain increases the 7094 sensitivity. Some panels will require further settings. The only setting that is implemented via handheld is the Input Gain. The default value is 10 (arbitrary metric), and if the 7094 cannot decode the dialing digits, for instance, it can be changed to 20, making the 7094 capable of hearing the digits dialed by the AP.

From the CONFIG screen Press F5 to go down, until you will see

**Config (E to exit)**
**4: AP Input gain**
**Current: 10**
**F3:CHG,F4:UP,F5:DOWN**

Use F3 to change the value:

**AP Input gain**
**Current: 10**
**New (A=10,B=20):**
**Type A/B, ESC=exit**

## 7.5 Intercept on blind dial

Intercept on AP blind dial should be used when the panel does not wait for a dial tone (the AP goes off hook and starts dialing after a pre-defined period of time). When this option is turned to YES, as soon as the AP goes off hook, the 7094 expects the digits, skipping the initial dial tone.

From the CONFIG screen Press F5 to go down, until you will see

**Config (E to exit)**
**5:Intcept on bl.dial**
**NO**
**F3:CHG,F4:UP,F5:DOWN**

Press F3 to change the value:

**Intercept on blind**
**dial?: NO**
**New: [Y/N]**
**Type Y/N, ESC=exit**

## 7.6 Line Cut Report

This setting is only effective when POTS=YES. By default, the Line Cut Report is YES.
NOTE:
If you have the following setting:
POTS=YES and Line Cut Report=NO and then you change to
POTS=NO, and then change again to POTS=YES, this setting will return to YES (i.e., your previous setting will be overwritten)
From the CONFIG screen Press F5 to go down until you see

**Config (E to exit)**
**6:Line Cut Report**
**Current: YES**
**F3:CHG,F4:UP,F5:DOWN**

Use F3 to change the value

**Line Cut Report**
**Current: YES**
**New: [Y/N]**
**Type Y/N ESC=exit**

If you type N, it will change to NO, and will return to the CONFIG screen

## 7.7 POTS cut report delay

The default setting is 45 seconds. The maximum setting is 9999.
Note: If the line condition is restored before the set time elapses then no signal will be sent.
From the CONFIG screen Press F5 to go down until you see

**Config (E to exit)**
**7:POTS cut report dly**
**Current (sec): 45**
**F3:CHG,F4:UP,F5:DOWN**

Use F3 to change the value:

**POTS cut report dly**
**Current (sec): 45**
**New(max9999)**
**Type value,ESC=exit**

## 7.8 POTS restoral delay

This option is to set a value to wait before issuing a restoral on the telephone line. It would assure the line is stable before restoring. The default value is 60 sec and the maximum value is 9999.
From the CONFIG screen Press F5 to go down until you see

**Config (E to exit)**
**8POTS restoral delay**
**Current (sec): 60**
**F3:CHG,F4:UP,F5:DOWN**

Use F3 to change the value

**POTS restoral delay**
**Current (sec):60**
**New(max9999)**
**Type value,ESC=exit**

## 7.9 ACCT Override

The primary need for this option would be a panel takeover tool as well as a full data communicator. Its default setting is NO but when set to YES the account number of the AES subscriber would be used in place of the account number in the control panel. This would also accommodate the automation software packages that do not allow 2 account numbers in one customer account.

From the CONFIG screen Press F5 to go down until you see

| |
|---|
| **Config (E to exit)**<br>**9:AP ACCT Override**<br>**Current: NO**<br>**F3:CHG,F4:UP,F5:DOWN** |

Use F3 to change the value:

| |
|---|
| **AP ACCT Override**<br>**Current :NO**<br>**New: [Y/N]**<br>**Type Y/N,ESC=exit** |

## 7.10 POTS Input Gain

POTS Input gain increases the 7094 phone line sensitivity when the phone line is connected and POTS=YES. The default value is 20 (arbitrary metric) and reducing this value will decrease the phone line sensitivity.

From the CONFIG screen Press F5 to go down, until you will see

| |
|---|
| **Config (E to exit)**<br>**10:POTS Input gain**<br>**Current: 20**<br>**F3:CHG,F4:UP,F5:DOWN** |

Use F3 to change the value:

| |
|---|
| **POTS Input gain**<br>**Current:20**<br>**New (A=0,B=10,C=20):**<br>**Type A/B/C, ESC=exit** |

# 8 Monitoring what is happening

## 8.1 Using the Handheld display

The 7094 allows you to leave the handheld connected while the unit is in operation, so you can have a better feedback on the events that are going on.

Some of the information displayed:

| |
|---|
| **POTS:CUT,7094=POTS** |

That means that the POTS was configured as present, but is not connected or has been cut, and the 7094 is now emulating the POTS

| | |
|---|---|
| **POTS:CUT,7094=POTS**<br>**AP<-TAP:Dial Tone**<br>**OFF-HOOK** | AP<-TAP: the TAP is "doing something to the AP", in this case, issuing the dial tone. Also, before that, the AP went off-hook and the TAP detected it |
| **DIG:5551212**<br>**OFF-HOOK** | AP is dialing, and the number decoded is displayed |
| **DIG:5551212**<br>**RING-BACK** | AP dialing sequence completed, and the 7094 is issuing the ring-back tones to the AP (and soon the 7094 will emulate the other side answering) |
| **CID HS:1400+2300**<br>**CID** | The "other side" (still inside the 7094) answered, it is in CID mode, and issues the CID handshakes |
| **1234 18 1 110 01 001**<br>**CID ON** | The AP sends the CID message, displayed on the LCD |
| **1234 18 1 110 01 001**<br>**TAP->SUB: OK** | The 7094 contacted the subscriber, and transferred the CID message, and the subscriber confirmed that it got it and will transmit it (if the subscriber was unable to transmit, the OK would not be displayed, and the kiss off would not be issued) |
| **1234 18 1 110 01 001**<br>**AP<-TAP:KISSOFF** | The 7094 has assurance from the subscriber that the message will go, so it sends the kiss off to the AP. The AP will either hang-up (on-hook) or send another CID message (it will not hang-up, and the 7094 will issue another HS) |
| **1234 18 1 110 01 001**<br>**ON-HOOK (^lastmsg^)** | Upon CID flushing, the AP will go on-hook, and the LCD will display the last CID message received and sent to the CS |

## 8.2 Interpreting the LED blinking patterns

The 7094 has one single RED LED that has a slow blinking pattern (1 pulse per second) when all is working properly. If it becomes SOLID, it is a malfunction and the board has to be sent for maintenance. If it blinks at a faster rate (2 pulses per second) it indicates that the 7094 cannot communicate with the subscriber. In this case, the 7094 also trips the trouble output.

# 9 Usage of the 7094

## 9.1 Without a phone line

Program POTS = NO. The 7094 will generate all the voltages to emulate an actual phone line. Its emulations is 100% compatible, issuing the wet voltage, dial-tone, ring back, and full DTMF digits decoding.

Because some panels are pre-programmed to have a pause between the 1st and the 2nd digits, the 7094 has a longer delay after the 1st digit (4 seconds) compared to the normal delay after any of the other digits (2 seconds) to assume that the dialing sequence has been completed and that the ring-back tone has to be issued, and right after that, the connect tone specific to the format supported.

## 9.2 With a phone line

The 7094 is capable of decoding all the DTMF digits present on a typical PSTN phone connection.

### 9.2.1 Intercept on specific dial sequence

Set to POTS = YES, and enter the phone number that the AP dials. This can be the single phone number or you can have dual numbers programmed on the AP, so one of the numbers will engage the 7094. The default number is 555, but it can be changed via the handheld or via the IntelliLoader.
NOTE:
When a phone line is present, and it is removed (line cut), the 7094 engages the phone line simulation immediately, so the panel does not notice that there is no phone line, and in this case, it will act on any number dialed, not only the Intercept phone number.

### 9.2.2 Intercept on any dial sequence

Set to POTS = YES, and enter the phone number as *** (3 asterisks). This will cause the 7094 to engage on any number dialed, with 3 or more.

# 10 Connecting the 7094 to the AP

## 10.1 Without a phone line

Connect the Tip and Ring of the AP to the terminal block labeled: AP TIP RING

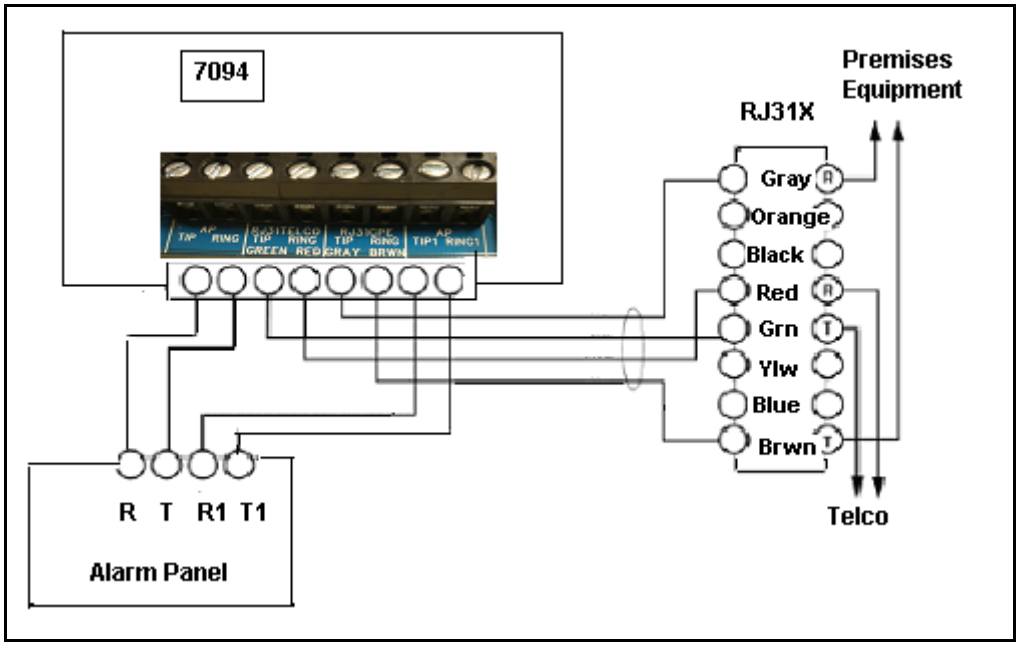
## 10.2 With a phone line, no CPE wiring

Connect the Tip and Ring of the AP to the terminal block labeled: AP TIP RING
Connect the Tip and Ring of the POTS to the terminal block labeled: RJ31TELCO TIP RING

## 10.3 With a phone line, CPE wiring

Connect the Tip and Ring of the AP to the terminal block labeled: AP TIP RING
Connect the Tip and Ring of the POTS to terminal block labeled: RJ31TELCO TIP RING
Connect the Tip1 and Ring1 of the AP to terminal block: AP TIP1 RING1
Connect the Tip and Ring of the RJ31CPE to term. Block: RJ31CPE TIP RING

Figure below shows the diagram for wiring the 7094 with an AP, phone line and CPE



# 11 POTS Line monitoring and reporting

When POTS=YES, the 7094 also monitors the presence of the phone line. In case the line is cut, the 7094 immediately engages the phone line emulation (7094=POTS is displayed on the LCD).

If Line Cut Reporting is enabled (see item 7.6 - Line Cut Report, on page 11), the programmable timer (default is 45 seconds, programmable) starts counting. If the line is restored before the timer expires, no alarm is sent. However, if the timer expires, a line cut alarm is sent (E351 C905).

When the line is restored, the 7094 starts a new timer. If the line is cut before this timer expires, nothing happens (as the E351 has already been sent). If the line remains restored for the programmable period (60 seconds), the 7094 will stop emulating the phone line, connected the POTS directly to the AP, and sends a restoral (R351).

For details, see sections 7.6- Line Cut Report on page 11, section 7.7 - POTS cut report delay on page 12 and section 7.8- POTS restoral delay on page 12

# 12 Trouble output

There is an open collector output on the 7094 board marked "Trouble". If the subscriber is "off" the network, the subscriber will not accept data from the 7094. The 7094 detects the problem. It will not accept messages from the alarm panel dialer attempts. During this condition, the 7094 activates the “TROUBLE” output to annunciate the problem to another device.

The "TROUBLE" Output is activated if:
• After an unsuccessful attempt to communicate with the AES Radio Subscriber Unit
• If the subscriber is off the network, or the subscriber buffer is full

The "TROUBLE" Output is De-Activated when:
• Reset of 7094 module, OR
• A new dialer call from the alarm panel, OR
• The subscriber returns to the network, or the subscriber buffer is cleared

# 13 Format: Contact ID

The 7094 is fully compliant with the CID protocol. For details on the CID protocol, please consult the documentation SIA DC-05-1999.09.

Some panels have an invalid method of calculating the check-sum, and the 7094 can detects this exact event and correct it. When this happens, a quick message is displayed on the LCD indicating that the CID has been corrected.

Select option “C” (for details on how to configure the 7094 to process CID, see section 7.3.1 - CID Alarm Format on page 9).

# 14 Format: Bosch/Radionics Modem 2 and Modem 3

Select option "M" (for details on how to configure the 7094 to process Modem formats, see section 7.3.2 - Modem Alarm format on page 9)

## 14.1 Settings for Modem

| Modem Format | Speed | Panel Family Supported |
|---|---|---|
| Modem II | 110 | 6112 |
| Modem II | 110 | 7112 |
| Modem II | 110 | 8112 |
| Modem IIe | 300 | 2212 |
| Modem III | 300 | 7412/9412 |

For details on the translation between Modem formats and contact ID, please contact AES.

## 14.2 Modem 2 format – unknown panel type family assignment

Because there are multiple variations on the panel type for the ModemII format, the 7094 implements a way to associate a never seen panel type with one of the Bosch panel families that had Modem II, such as 6112, 7112, 8112.
This type of configuration is only needed when an unknown panel supporting Modem II is connected to the 7094.
When the "new" panel type code is detected, the 7094 saves it to its non-volatile memory and offers the option to allow the user to associate with the proper panel family.
NOTE: THIS FEATURE IS NEEDED AND AVAILABLE FOR THE MODEM II AP FORMAT ONLY.

### 14.2.1 How do I know that I have an "unknown" panel type

If an AP with a panel type not currently present on the 7094 internal database tries to communicate with the 7094, you will be able to see the following message on the handheld programmer connected to 7094

**7094v1.150 F1=config**
**ERR: NEW MODEM2 TYPE**
**F1 FOR FAMILY SETUP**

### 14.2.2 How to associate a family with an unknown type?

Once you enter in the CONFIG mode, navigate using F5.

From the CONFIG menu, press F5 to go down until you see the sub menu for the MODEM2: FAMILY SETUP

**NOTE:**
This sub menu is only available if the report format is MODEM, AND its format is MODEM2, AND an "unknown panel type has been detected)

| | |
|---|---|
| **MODEM2: FAMILY SETUP**<br>**AP Type [E3]=NONE**<br><br>**F3:CHG,F4:UP,F5:DOWN** | Where E3 is an example of an unknown panel type<br><br>Press F3 to change the value |

| | |
|---|---|
| **MODEM2: FAMILY SETUP**<br>**AP Type [E3]=NONE**<br>**A=6112,B=7112,C=8112**<br>**Type A/B/C,ESC=exit** | Where E3 is an example of an unknown panel type |

Select the appropriate family type by pressing either "A", "B" or "C". Once the panel family is selected, the 7094 will associate the panel type with the panel family, and will be able to process the AP messages for this new panel type code. This association is stored into the 7094 non-volatile memory.

### 14.2.3 How to change it to another family

Once you enter in the CONFIG mode, navigate using F5.
From the CONFIG menu, press F5 to go down until you see the sub menu for the MODEM2: FAMILY SETUP

| | |
|---|---|
| **MODEM2: FAMILY SETUP**<br>**AP Type [E3]=8112**<br><br>**F3:CHG,F4:UP,F5:DOWN** | Press F3 to change the value |

| | |
|---|---|
| **MODEM2: FAMILY SETUP**<br>**AP Type [E3]=8112**<br>**A=6112,B=7112,C=8112**<br>**Type A/B/C,ESC=exit** | Type A/B or C to change the value |

Press the letter associated with the new family.

| |
|---|
| **MODEM2: FAMILY SETUP**<br>**AP Type [E3]=6112**<br><br>**F3:CHG,F4:UP,F5:DOWN** |

## 14.3 Bosch/Radionics panels supported

Below there is a list of the panels that we had the opportunity to test and validate the protocol translation. Some of these have been tested by AES, others have been tested by AES customer, selected as beta-testers.

| Panel Model | Revision Number | Format Tested |
|---|---|---|
| D7412GV2 | 7.08 | Modem III |
| D7412GV3 | 8.03 | Modem III |
| D8112E1/G1 | 22 | Pulse Only |
| D8112G2 | 31.31 | Modem II |
| D6112 | 4.0 | Modem II |
| D2212B | 3.03 | Modem II e |
| D4412 | 1.12 | Modem III |
| D9412G | 6.6 | Modem III |

NOTE:
Even if the panel you are connecting to, does not show on the list, it does not mean that it is not supported. It is probably supported, we just did not have a chance to test with it.

# 15 Format: Pulse

Select Option "P" (for details on how to configure the 7094 to process Pulse formats see section 7.3.3 - Pulse Alarm format on page 10)

## 15.1 Settings for common pulse formats

Table below shows the different pulse formats supported and the corresponding values of the different parameters for each of these formats.

| | HSD | HSF | CF | IDT | IRT |
|---|---|---|---|---|---|
| **Pulse Format** | sec | kHz | KHz | sec | sec |
| Ademco LS (10 pps) (4+2) | 0.8 | 1.4 | 1.9 | 0.9 | 3 |
| Ademco LS (10 pps) (3+1) | 0.8 | 1.4 | 1.9 | 0.9 | 5 |
| Ademco LS (10 pps) (4+1) | 0.8 | 1.4 | 1.9 | 0.9 | 5 |
| Ademco LS Double Round (3+1 Expanded) | 0.8 | 2.3 | 1.9 | 1.7 | 5 |
| Ademco HS Double Round (3+1 Expanded) | 0.8 | 2.3 | 1.9 | 0.9 | 5 |
| Ademco Slow Silent Knight Slow, HS 1400 Hz | 0.8 | 1.4 | 1.8 | 1.7 | 5 |
| Ademco Slow Silent Knight Slow, HS 2300 Hz | 0.8 | 2.3 | 1.8 | 1.7 | 5 |
| Radionics Fast (20pps) (4+2) | 0.4 | 2.3 | 1.8 | 0.7 | 3 |
| Radionics Fast (20pps) (4+1) | 0.8 | 2.3 | 1.8 | 0.7 | 3 |
| Radionics Fast (20pps) (3+1) | 0.8 | 2.3 | 1.8 | 0.7 | 3 |
| Radionics (20pps) (4+2) | 0.8 | 2.3 | 1.9 | 0.7 | 3 |
| Silent Knight LS Double Round (3+1 Expanded) | 0.8 | 2.3 | 1.9 | 1.7 | 5 |
| Silent Knight HS Double Round (3+1 Expanded) | 0.8 | 2.3 | 1.9 | 0.9 | 5 |
| Silent Knight Fast | 0.8 | 2.3 | 1.9 | 0.9 | 5 |
| Universal High Speed, hand shake 1400Hz | 0.8 | 1.4 | 1.8 | 0.7 | 5 |
| Universal High Speed, hand shake 2300Hz | 0.8 | 2.3 | 1.8 | 0.7 | 5 |

HSD – Handshake duration
HSF – Handshake frequency
IDT – Inter digit time-out
CF – Center frequency
IRT – Inter Round time-out

## 15.2 Settings for non-supported formats

Even though some high speed formats will not work with the 7094 as 7094 currently supports only 10 and 20pps formats, on all of the alarm panels tested, the panel automatically changes to a lower speed after trying to send data to the 7094 over the phone dialer interface a couple of times.

Some recommended settings for common high speed formats (when the low speed is implemented) is listed next. When the alarm panel reduces the speed, the 7094 will be able to successfully interpret the data sent by the AP over the phone dialer interface. NOTE: These settings are only for the "fail safe" drop speed. These are not the settings for the actual 33 or 40 pps that are not supported by the 7094.

| **Pulse Format / Recommend Fail Safe settings** | **HSD** | **HSF** | **CF** | **IDT** | **IRT** |
|---|---|---|---|---|---|
| | sec | kHz | KHz | sec | sec |
| Radionics Fast Double Round (33pps) | 0.8 | 2.3 | 1.9 | 0.7 | 5 |
| Radionics Fast (40 pps Double Round) | 0.8 | 1.4 | 1.8 | 0.7 | 5 |

## 15.3 Notes on pulse formats

### 15.3.1 Number of digits on Pulse format

For the pulse format, there is no selection for the number of digits, as this is easily extracted by interpreting the pulse train.

- If 6 digits are received, it translates into 4+2
- If 5 digits are received, it translates in 4+1
- If 4 digits are received, it translates in 3+1

### 15.3.2 Double round

In addition, the detection of double round is also automatic, so there is no need to configure it (double round is the method used by pulse protocol to confirm that the data has no error, by sending the same message twice).

### 15.3.3 Translation of 3+1,4+1 to 4+2

1234 56 arrives at Multinet as 1234 56
1234 5 arrives at Multinet as 1234 05
123 5 arrives at Multinet as 0123 05

### 15.3.4 Expanded format

We do not recommend using expanded format, because of the way the messages will reach Multinet.

When the AP is programmed for Expanded format (do not confuse with double round), it sends 2 trains of pulses (4 total, because of the double round), and the 7094 sends the 2 messages received. This has to be handled carefully at the automation side, once the two messages will have a "different" account. An expanded format configuration will produce a total of 4 pulse trains.

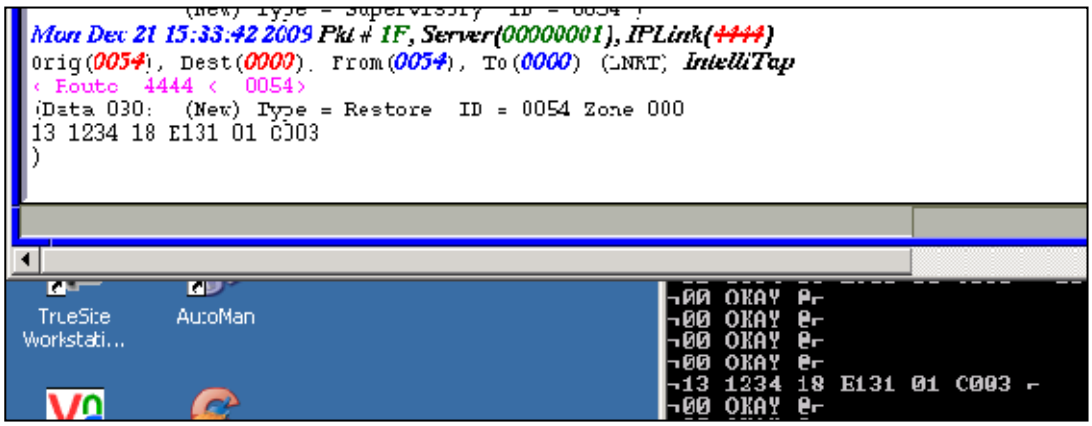
1st: 5879 6 (4+1)→ 6879 06 (4+2)
2nd 6666 3 (4+1)→ 6666 03 (4+2)

For instance, on the expanded, it would send the following two messages, and each one would produce a message at automation.
1234 6 1234 6 --> 1234 06 ACCT 1234 RF 5555 RL=14
6666 8 6666 8 --> 6666 08 ACCT 6666 RF 5555 RL=14

# 16 How to test - IPCtrl and automation messages

## 16.1 Zone tripped on alarm panel

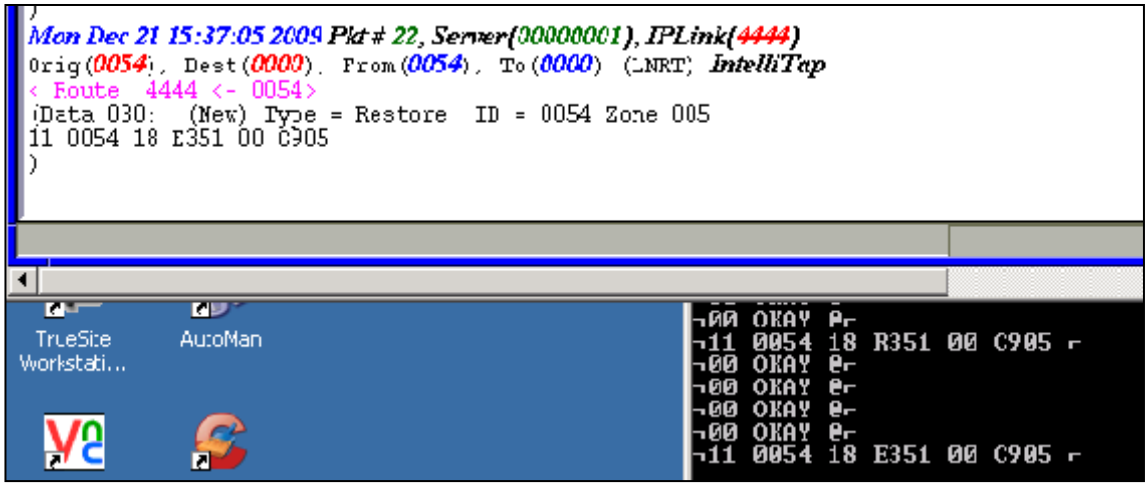
Panel ID is 1234 (subscriber ID is 0054), alarm tripped on Zone 3
Note the Receiver = 1 (defined by business unit configuration), but the line card as 3, indicating that it is a tap message (a message from the 7094, not from the subscriber), so the AP ID is preserved. This is also programmable (not at this release), so the ID could also be the ID of the subscriber, not the AP.




## 16.2 POTS Line cut detected

Subscriber ID is 0054, receiver = 1 (Business Unit related) and Line Card = 1 (subscriber zones). Event is E351 C905 = line cut detected)

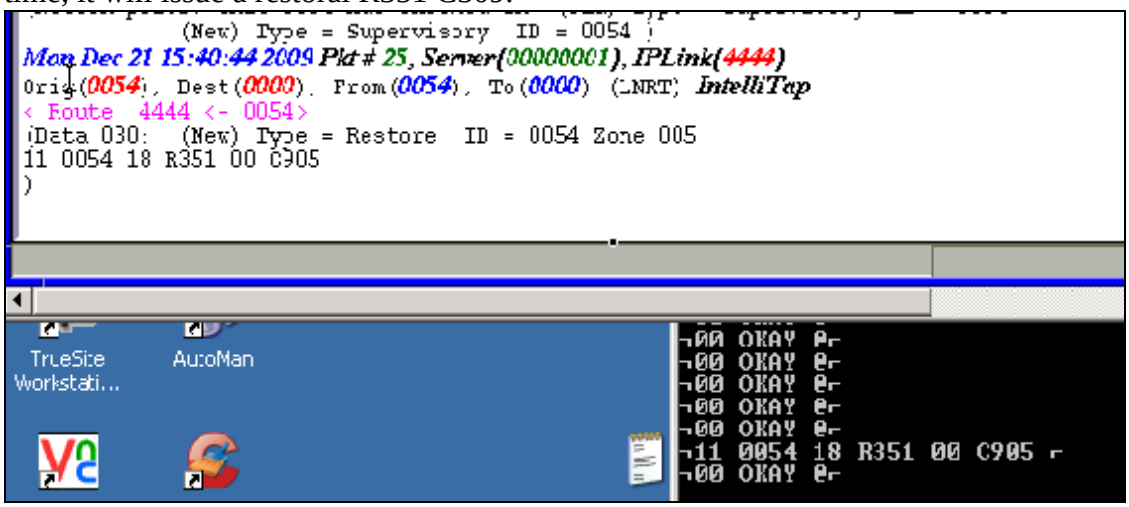
Remove the phone line
It may take up to 45 seconds for the 7094 to detect it
As soon as the handheld (if connected) LCD displays Line Cut, the 7094 will engage its line emulation, to avoid that the panel complains about a missing phone line. At the same time, a timer is started. Upon expiration (60 seconds, programmable via HyperTerminal), the E351 will be sent.



## 16.3 POTS Line restored

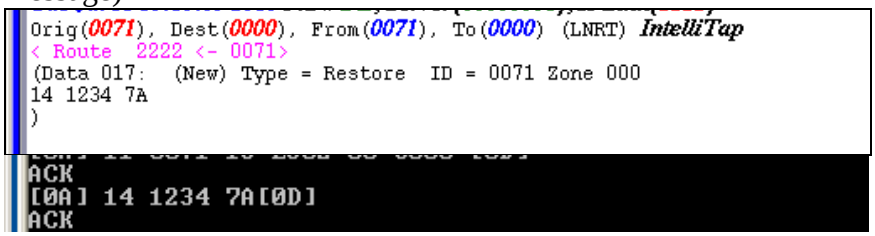
Subscriber ID is 0054, receiver = 1 (Business Unit related) and Line Card = 1 (subscriber zones). R351 C905 = line restored

Reconnect the phone line
It should be detected immediately.
The 7094 starts a timer, and if the line is still there upon expiration (60 seconds also), it will stop the POTS emulation and reconnect the original POTS to the AP. At the same time, it will issue a restoral R351 C309.




## 16.4 Pulse Format Transmission to MultiNet

Subscriber ID is 0071, receiver =1 (Business Unit related) and Line Card = 4 (7094 message)




# 17 How to test the phone number interception

Connect the AP to the 7094 AP Tip-Ring
Connect the POTS to the 7094 RJ31TELCO Tip-Ring
Lets say the AP programmed phone number is 800-555-1212
Make sure the 7094 intercept number is set to none
Trip an alarm on the AP
It will go via the dialer to the receiver at 800-555-1212
Now, change the 7094 intercept number from <none> to 800-555-1212
Trip an alarm on the AP
Now, the 7094 will intercept the number, and the alarm will be processed by the Intellinet network.

### 17.1 What to do if there is no interception

Depending on the phone line circuit, and the AP interface to the phone line, there are cases when the 7094 may be too sensitive and may not interpret the dial tone from the POTS to the AP, or the digits dialed by the AP. In such cases, reducing the gain (sensitivity) of the POTS monitor may solve the issue. For details, see item 7.10 - POTS Input Gain, on page 13.

# 18 How to troubleshoot the connection to the AP

When the Handheld is connected, as soon as the AP takes the line off-hook, all the call evolution is displayed on the LCD of the handheld.
One good way to identify problems is to monitor the call sequence.
For instance, if the AP has a phone number 555-1212 as the number to be dialed, you should see a message on the LCD that shows: DIG 5551212
If you see, for instance, 55511, it is an indication that the AP is "too low", and we need to increase the sensitivity of the 7094. Change the gain to 20, and now the complete dialing sequence will be displayed.
It is a good procedure test to program the AP to all digits (for instance, a CS number such as 1234567890) and see if all of them are displayed on the LCD of the 7094.

You can also use the same approach if the AP fails during the HS (handshake 1400+2300, 1400, or 2300). However, usually if the digits are properly detected and the HS fails, it is most likely because the AP is not using the same format that the 7094 is configured to decode. Change the format either at the 7094 or at the AP.

### 18.1 Increasing the sensitivity of the 7094

In most cases (failed sequence or failed HS), the solution is to increase the 7094 AP input gain.

Use the F1 CONFIG menu, and navigate to option 4, AP Input Gain.
You have 2 options, and unit is pre-programmed at 10. Press B to change it to 20. The modified value will be saved on the non-volatile memory of the 7094.

# 19 Two way programming

This manual is for the one way alarm delivery. For details on how to use the 7094 on two way programming, please contact AES.

# 20 Revision history

| Revision | Date | Author | History |
|---|---|---|---|
| 1.0 | 2009DEC22 | BG | Initial draft (7067U) |
| 2.0 | 2010FEB19 | BG | Modifications for 7094 |
| 3.0 | 2010MAY12 | BG | Update monitor info |
| 4.0 | 2010JUL15 | BG/PP | Inclusion of pulse format |
| 4.4 | 2010UL16 | BG/PP | Expansion of pulse format |
| 4.5 | 2010OCT27 | BG/PP | Changes for revision 1.104 |
| 4.6 | 2010OCT29 | BG/PP | Changes for revision 1.131 BETA MODEM |
| 4.7 | 2010NOV02 | BG/PP | Changes for revision 1.134 |
| 4.8 | 2010NOV12 | BG/PP | Changes for revision 1.143 RELEASE MODEM |
| 4.8d | 2010DEC01 | BG/PP | Changes for revision 1.150 release |
| 4.9 | 2015JUN09 | PM | Add insulating washers to H1 and H3 mounting holes |

**AES SERVICE PROCEDURE:** Contact AES at (978) 535-7310, [fax (978) 535-7313] to receive a Return Authorization Number. Have the AES part number and serial number ready. Repack equipment in original or equivalent packaging. Inside the box, please include a contact name, telephone number, address and a brief description of the reason for return.

**Ship authorized RA items freight-prepaid to:** (Contact AES for Return Authorization number)

Repair Services, RA#_____
AES Corporation
285 Newbury Street
Peabody, MA 01960 USA