



AES 7094 IntelliPro

Quick Install

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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 or PULSE 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

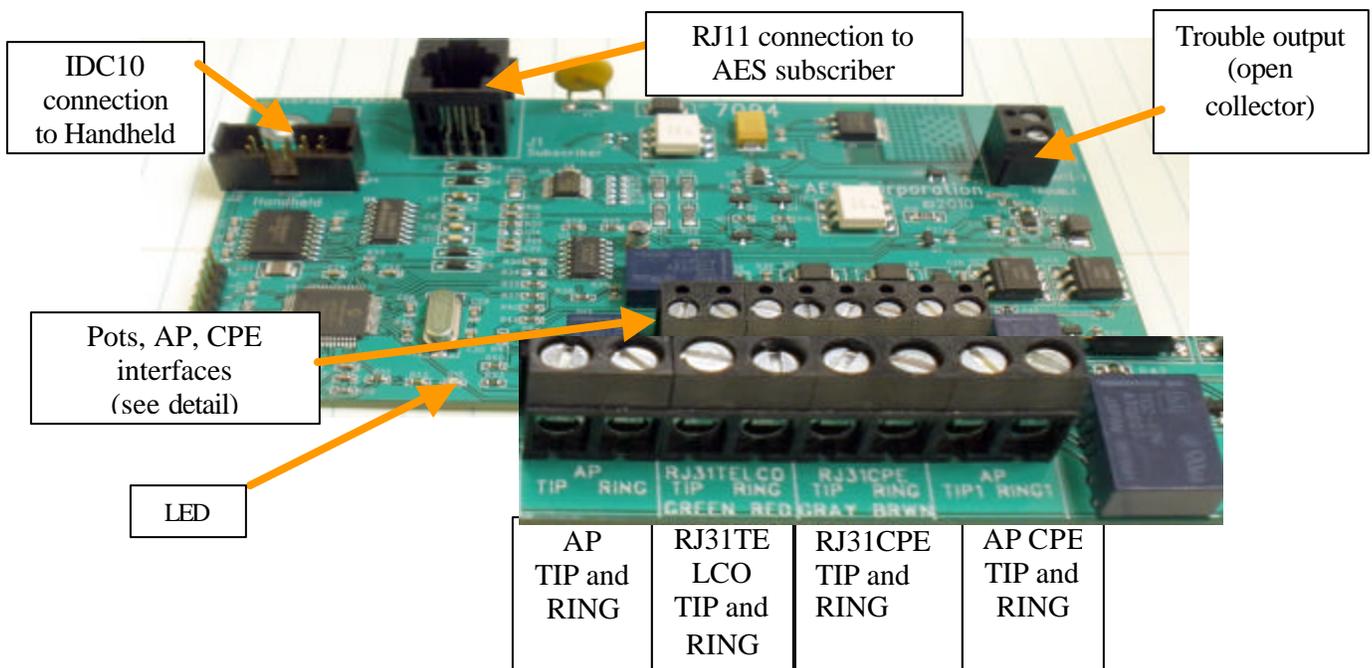
The 7094 is a dialer capture module with monitoring capabilities as well as full emulation of the POTS for incoming data (incoming to the 7094, dialed from the AP). It can operate with or without a phone line, and can monitor the phone line presence as well. It can also intercept the phone line connection 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, etc), and how to operate a functional installation of the Multinet environment (IPctrl, automation, etc)



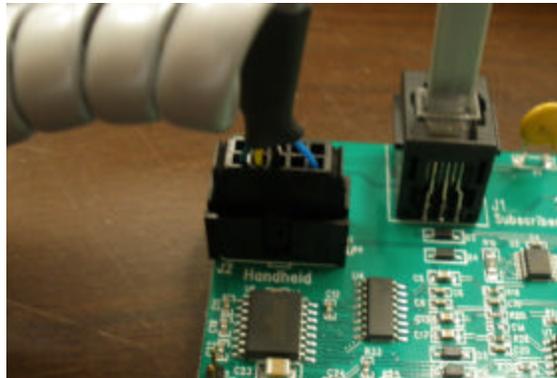
2 Connecting the 7094 to the handheld and to the subscriber

In order to configure/program the 7094 you need the handheld attached to the IDC port (connector J2).

Connect the IDC10 between the handheld and the 7094



Then connect the RJ11 to the subscriber.



The LCD of the handheld will display

```
7094v0.063 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.)

3 Programming the 7094

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

3.1 Basic configuration

There are only 2 programming settings at this time that are relevant for quick test. These are 2 of the all 4 settings available from the hand held.

- POTS is present: YES/NO
- Intercept number is: <none>,[***],or 555 (for instance)

3.1.1 POTS presence

Press F1, and you will see:

```
Config (E to exit)
1: Phone line:
YES
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: 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.

3.1.2 Intercept number

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

```
Config (E to exit)
2: Intercept number:
<none>
F3: CHG, F4: UP, F5: DOWN
```

Press F3 to enter a phone number, for instance, 555, and press enter

```
Intercept number:
555
Type numb +ENTER/ESC
```

It will change to

```
Config (E to exit)
2: Intercept number:
555
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.

3.2 Advanced configuration

There are 2 more settings, usually not required for normal operation:

- Intercept on AP blind dial: YES/NO
- Input gain (10/20)

3.2.1 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 AP 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)
3: Intcpt on bl.dial
NO
F3: CHG, F4: UP, F5: DOWN
```

Use F3 to change the value:

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

3.2.2 Input gain

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: Input gain
Current: 10
F3: CHG, F4: UP, F5: DOWN
```

Use F3 to change the value:

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

3.2.3 Alarm Panel report format

This setting allows you to modify the way the 7094 interprets the report format. If the panel is configured to report alarms using the Contact ID format, use this setting to make the 7094 interpret the CID and send the data to the Multinet. Current options are Contact ID and PULSE formats (10 pulses per seconds and 20 pulses per second). For the supported formats, please see item 8 - Supported Alarm Formats, on page 11.

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

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

Use F3 to change the value:

```
AP Report Format
Current: CID
C=CID, 1/2=10/20PPS
Type C/1/2, ESC=exit
```

```
C= CID
1 = 10 pps, hand-shake freq: 1400 Hz
2 = 20 pps, hand-shake freq: 2300 Hz
```

4 Monitoring what is happening

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
AP<-TAP: Dial Tone
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
OFF-HOOK
```

AP is dialing, and the number decoded is displayed

```
DIG: 5551212
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 MS: 1400+2300
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
CID ON
```

The AP sends the CID message, displayed on the LCD

```
1234 18 1 110 01 001
TAP->SUB: OK
```

The 7094 contacted the subscriber, and transferred the CID message, and the subscriber confirmed that got it and that will transmits 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
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
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

5 Usage of the 7094

5.1 Without a phone line

Program POTS = NO. The 7094 will generate all the voltages to emulate an actual phone line.

5.2 With a phone line

5.2.1 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.

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.

5.2.2 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.

As soon as the line is cut, it starts a timer to send an alarm. The “debounce” time is programmable

6 Connecting the 7094 to the AP

6.1 Without a phone line

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

6.2 With a phone line, no CPE wiring

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

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

6.3 With a phone line, CPE wiring

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

Connect the Tip and Ring of the POTS to term. block labeled: RJ31TELCO TIP RING

Connect the Tip1 and Ring1 of the AP to term.block: AP TIP1 RING1

Connect the Tip and Ring of the RJ31CPE to term. Block: RJ31CPE TIP AND RING

7 POTS Line monitoring

When POTS=YES, the 7094 also monitor the presence of the phone line. In case the line is cut, the 7094 may take up to 45 seconds to detect it, and as soon as it is detected, it engages the phone line emulation (this is displayed on the hand held), and it starts a timer (programmable) of 60 seconds. If the line is restored before the timer expires, no alarm is sent. If not, an alarm of line cut is sent. (E351)

8 Supported Alarm Formats

The 7094 currently supports the following formats:

- Contact ID (Ademco CID)
- Pulse formats at 10 pulses per second, with handshake and kiss-off at 1400 Hz (Ademco Pulse)
- Pulse formats at 20 pulses per second, with handshake and kiss-off at 2300 Hz (Radionics Pulse)

8.1 Settings for Contact ID

DTMF decoding, CID specifications, hand-shake and kiss-off at 1400/2300 Hz. Select option “C” (for details, see 3.2.3 - Alarm Panel report format, on page 7)

8.2 Settings for Ademco Low Speed / Standard

10 pulses per second, hand-shake and kiss-off at 1400 Hz

Formats: 3+1, 4+1, 4+2

Select option “1” (for details, see 3.2.3 - Alarm Panel report format, on page 7)

8.3 Settings for Radionics Standard

20 pulses per second, hand-shake and kiss-off at 2300 Hz

Formats: 3+1, 4+1, 4+2

Select option “2” (for details, see 3.2.3 - Alarm Panel report format, on page 7)

8.4 Notes on alarm formats

8.4.1 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

8.4.2 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).

8.4.3 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

8.4.4 Expanded format

We do not recommend using expand 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

9 How to test - IPCtrl and automation messages

9.1 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.

```

(new) type = supervisory id = 0004
Mon Dec 21 15:33:42 2009 Pkt # 1F, Server(00000001), IPLink(4444)
Orig(0054), Dest(0000), From(0054), To(0000) (NRT) IntelliTap
< Route 4444 <- 0054 >
iData 030: (New) Type = Restore ID = 0054 Zone 000
13 1234 18 E131 01 C003
)

```



9.2 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

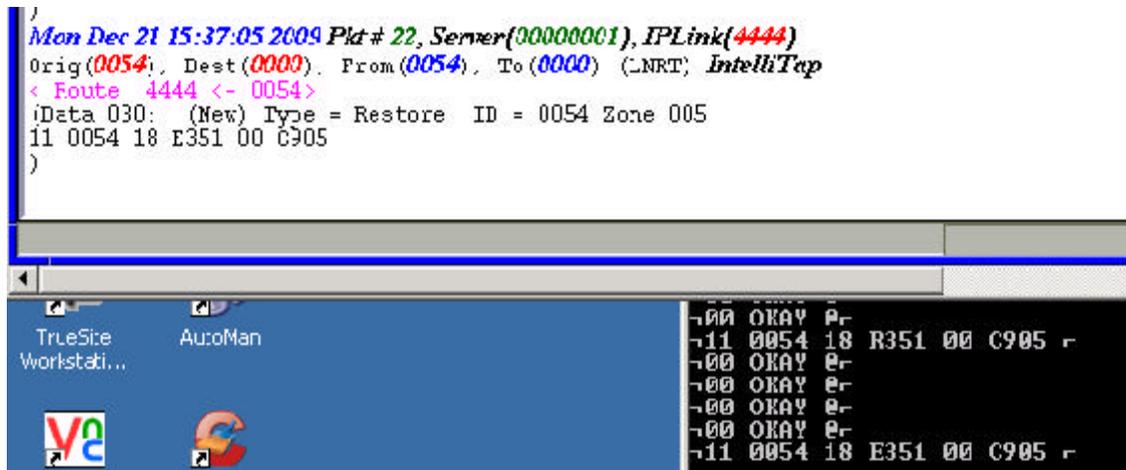
It may take up to 45 seconds for the 7094 to detect it

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.

```

)
Mon Dec 21 15:37:05 2009 Pkt # 22, Server(00000001), IPLink(4444)
Orig(0054), Dest(0000), From(0054), To(0000) (NRT) IntelliTap
< Route 4444 <- 0054 >
iData 030: (New) Type = Restore ID = 0054 Zone 005
11 0054 18 E351 00 C905
)

```



10 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.

You can also program the intercept number to ***, so it will intercept any number dialed.

11 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 234567890) 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.

11.1 Increasing the sensitivity of the 7094

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

Use the F1 config menu, and navigate to option 4, 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.

12 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