

AlarmNet[®] Network Overview

AlarmNet[®] is a family of communications services designed specifically for the security industry. AlarmNet is designed to be a cost effective alternative or backup to the transmission of alarm signals over telephone lines. There are presently four types of network service available that utilize two different fundamental technologies:

Protected Premise Technology	Service Name
Wireless	AlarmNet-A, AlarmNet-M, AlarmNet-C
Internet	AlarmNet-i

What is unique about AlarmNet is that a change in protected premise technology does not require an equal change in central station equipment in order to monitor accounts. This technology protection is an important reason why so many central stations have chosen to become AlarmNet central stations. As new technologies or services become available, AlarmNet will expand to bring them to you for use at the protected premise. New technologies will give more subscribers access to AlarmNet services, and allow a broader variety of information to be sent at faster speeds without requiring significant additional investment and overhead at the central station

AlarmNet, Inc. provides the service. Ademco provides the equipment. Ademco has been serving the security industry for over 60 years. AlarmNet has been providing alarm reporting services since 1986. There are hundreds of central stations in the United States and Canada currently providing AlarmNet service to many thousands of homes and businesses throughout North America. AlarmNet service is available to any central station in the U.S or Canada, as well as to any security dealer who is served by a central monitoring station that offers it.

Network Architecture

In the AlarmNet architecture, although each of the networks are independent of one another, subscriber radios and Internet transmitters may send messages from one network (e.g. – AlarmNet-C) and be received at nearly any central station location in North America over another technology (e.g. – AlarmNet-M). The AlarmNet Network Control Center (NCC) accomplishes this integration. This design offers the following important benefits:

1. Integration of Multiple Networks

One of the fundamental principles behind AlarmNet is the integration of different network types. In the AlarmNet architecture, member central stations are equipped with AlarmNet wireless or Internet receiving equipment or both. This equipment communicates directly with the AlarmNet network. Depending on its needs at installation at the protected premise, an installer may choose to use any of the available types of subscriber radios or Internet transmitters, whichever works best for that installation. Although each of the different products may report through a different network, the central station does not need to incur the costs of time, money, or labor to operate, maintain, and integrate all of these networks. When a central station signs up with AlarmNet, it establishes a network connection scheme between the central station and AlarmNet and as a result gains access to any of its customers at the protected premise through that scheme and the interaction of AlarmNet

2. Learn One, Know Them All

All of the different subscriber devices used for the different network services have a similar look and feel. The same programming tool is used for most of the devices. All signals are delivered to the central station in a uniform, familiar reporting format. This assures that the central station can receive signals from any type of AlarmNet subscriber, past, present, or future. Once equipped to receive alarm messages from the AlarmNet network, the central station can provide network services to any subscriber without additional expense.

3. Supervision and Speed of Delivery

AlarmNet radios and transmitters are supervised on a regular basis. The supervision is performed automatically, and is transparent to the central station. The AlarmNet networks communicate with all AlarmNet devices regularly, assuring that they are operational. The AlarmNet network reports to the central station only when there is a problem. The central station does not need to worry about supervision or maintenance of the network, since the network performs these functions automatically. The central station only receives the signals it needs: actual alarm or trouble messages. When the network receives an alarm, it automatically and immediately forwards the signal to the appropriate central station. The AlarmNet transmission generally will reach the central station before the traditional dialer-based signal in cases where an AlarmNet device and the digital dialer both send signals.

4. Secure, Redundant, Wireless Protection

Not all competitive wireless subscriber services offered in the market are wireless at both ends. For example, due to the design of the cellular network, competing cellular services deliver signals to the central station over the regular switched telephone network. In these cases, the communications integrity of the central station (and all premises protected by that central station) is vulnerable to the same weaknesses as any landline-dependent customer (line cut, service outages, and natural disasters). Limited services such as these protect only a portion of the communications chain. Standard AlarmNet wireless delivery, however, assures an end-to-end wireless system that provides redundancy, supervision, and verification of message delivery. It only makes sense that the central station should use wireless communications to maintain the same level of security and performance in its communications infrastructure as it does at the protected premises.

In order to maintain a redundant, invulnerable link to subscribers using wireline-terminated networks, a service provider must maintain at least two physically distinct and independent connections to every network type. AlarmNet maintains such connections at every level, saving the central station the expense and complexity of maintaining such an elaborate communications infrastructure. AlarmNet's connection to the central station also has two layers of redundancy: every central station is equipped with a primary and backup transceiver.

Listings

AlarmNet services have been evaluated by UL for use with their associated Listed products. The product certifications include: Factory Mutual (FM), California State Fire Marshal (CSFM), New York City Fire Department Approved (MEA), and Underwriters Laboratories in the U.S (UL) and Canada (CUL or ULC). Below is a table of the specific listings offered by the AlarmNet products by technology as well as a table listing the central station services that can be offered when using AlarmNet protected premise equipment according to the guidelines of each class of service.

Table of Product Listings												
	UL Listing Domestic							UL Canada		Others		
	365	609	864	985	1023	1610	1635	CUL	ULC	CSFM	FM	MEA
AlarmNet-i												
7845i	✓	✓	✓	✓	✓	✓	✓	✓		*✓		
7810iR	✓	✓	✓			✓	✓	✓		*✓		
Symphony	✓	✓	✓	✓	✓	✓	✓	✓		✓		
AlarmNet-C												
7845C	✓	✓	✓	✓	✓	✓	✓	✓		*✓	✓	
7845CZ	✓	✓	✓	✓	✓	✓	✓	✓		*✓		
7835C	✓	✓			✓	✓	✓		✓			
7835CF	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓
AlarmNet-M												
7830R	✓				✓	✓	✓		✓			
AlarmNet-A												
7720Plus	✓				✓	✓	✓					
7720ULF			✓							✓	✓	✓
7820	✓				✓	✓						

Table of Central Station Services										
Grades →	A	AA	B	BB	C	CC	A – Police Station	Residential Burglary Warning	Residential Fire & Burg Warning	Canada Level
AlarmNet-i										
7845i	✓	✓	✓	✓	✓	✓	✓		✓	3
7810iR	✓	✓	✓	✓	✓	✓	✓			3
Symphony	✓	✓	✓	✓	✓	✓	✓		✓	3
AlarmNet-C										
7845C	✓		✓		✓		✓		✓	1
7845CZ	✓		✓		✓		✓		✓	1
7835C	✓		✓		✓		✓	✓		1
7835CF	✓		✓		✓		✓		✓	
AlarmNet-M										
7830R	✓	✓	✓	✓	✓	✓				2
AlarmNet-A										
7720Plus	✓		✓				✓			
7720ULF										
7820	✓		✓		✓		✓	✓		

* Pending

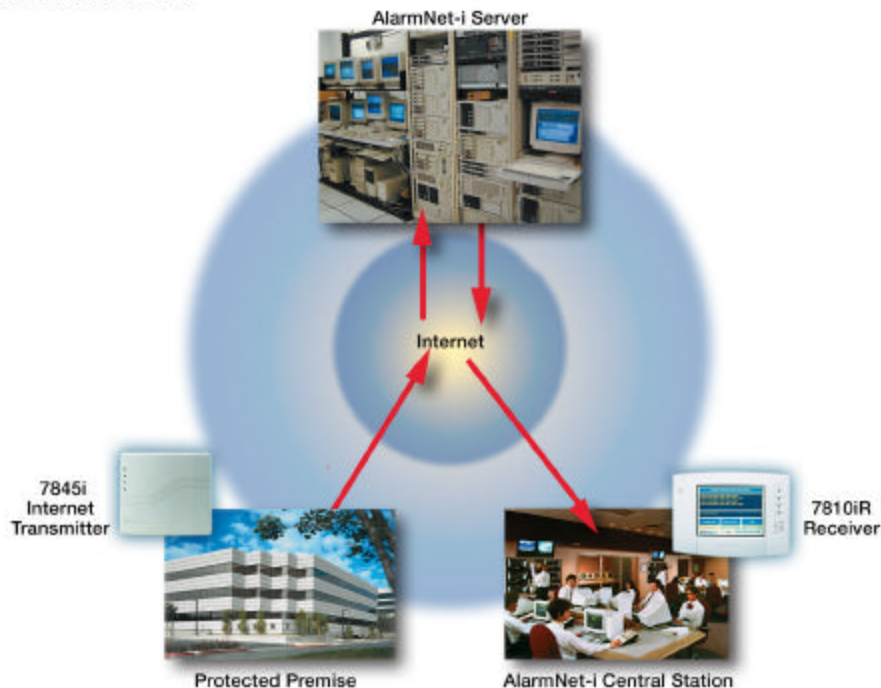
AlarmNet-i

AlarmNet-i is the newest technology and service offered by AlarmNet. Unlike AlarmNet radio based services, AlarmNet-i uses the Internet to deliver messages from the protected premise to AlarmNet. Once messages arrive at AlarmNet they can be routed to an AlarmNet central station over existing radio services. This is in keeping with the philosophy of AlarmNet to help control Central Station cost by allowing existing AlarmNet receiving technologies already in place to receive signals originated over the Internet from the protected premise. In addition, the Internet can also be used as a new way to route alarms to the central station from AlarmNet. This is accomplished with a new central station Internet receiver, the 7810iR.

Security Issues

No discussion of the Internet is complete without covering data security. Without major expense, a LAN or the Internet paths can be monitored so it makes sense that protecting the data is vital. AlarmNet-i is the most secure means of transmitting alarm signals through the Internet. It uses a very high level of encryption and two-way authentication. This allows installation of the transmitter anywhere along an existing LAN that has an always-on connection to the Internet. The data is secure from its connection point in the network all the way through AlarmNet and into the AlarmNet central station. Because it use two-way authentication, there is no chance of substitution at the central station or the protected premise.

AlarmNet-i



How AlarmNet-i Works

At the customer premises, one of the Ademco Internet transmitters (7845i or Symphony line of products) is hardwired to the Ademco control panel with a simple 4-wire connection. In the event of an alarm, the transmitter

sends a signal through the LAN and out through the Internet to AlarmNet. Once the signal has been received at AlarmNet, it is then transmitted either wirelessly through AlarmNet-A or AlarmNet-M, or over the Internet to the AlarmNet central station where the 7810iR Internet Receiver receives the signal. The 7810iR in turn passes signals out its RS232C port to:

- A 685-5 Line Card of a 685 Receiver or
- The Long Range Radio card of the new ADEMCO MX-8000 Receiver or
- Directly to an automation port of the central station automation system

As noted above, for existing AlarmNet central stations that receive signals through AlarmNet-A or AlarmNet-M radio systems, the Internet signals received by AlarmNet can be routed to the central station via radio, thus eliminating the need for investing in the additional Internet central station receiver.

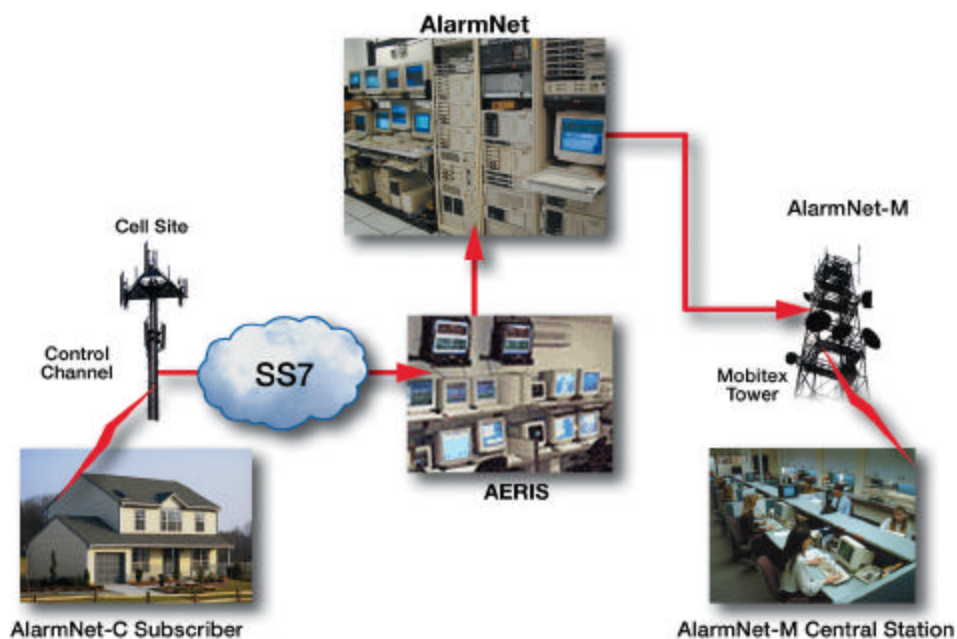
AlarmNet-C

AlarmNet-C is an AlarmNet service that operates over the control channel of the cellular telephone network (in conjunction with MicroBurst technology provided by Aeris Communications). The control channel has the same coverage as the analog cellular networks, but uses full power, has very little traffic and no “system busy” conditions. There are no monthly toll charges incurred since no cellular phone call occurs. This fact allows the service to be reasonably priced. Radios using the AlarmNet-C network can report into central stations equipped with AlarmNet-A, AlarmNet-M or AlarmNet-i receiving equipment. The control channel cellular radio works with most ADEMCO panels with a simple 4-wire connection and also has an on-board signal strength meter for easy installation. For panels that are not manufactured by ADEMCO, there is a version of the 7845C (7845CZ) that is also available.

How AlarmNet-C Works?

At the protected premise, the Ademco cellular radio (7845C or 7845CZ) is hardwired to the control panel. In the event of an alarm, the radio transmits a signal to the cellular network on its control channel. The actual transmission is accomplished using the same technology that enables any cellular phone to make calls from outside their local area. The radio links to the control channel network as if it were a regular cell phone but sends alarm data in place of the destination (called) telephone number. The cellular network then forwards the packet to our technology partner, Aeris, which then processes it and properly forwards it to AlarmNet. From AlarmNet, it is then forwarded to the appropriate central station. Subscribers are fully supervised and there is a low monthly charge for traffic. (Note – Due to technology restrictions within the cellular network, AlarmNet-C networks are presently used only to transmit signals from protected premises to AlarmNet. Signals are then forwarded to central stations via AlarmNet-A, AlarmNet-M or AlarmNet-i.

AlarmNet-C Control Channel Operation



(800) Plus Service

For those central stations whose facilities are located outside the coverage area of the AlarmNet networks and have not yet upgraded to AlarmNet-i within their central stations, AlarmNet offers (800) Plus service. This service forwards subscriber radio messages that have been received by AlarmNet and sends them to a toll free line belonging to the central station. This is done utilizing a group of dialer banks located at AlarmNet. This system is capable of sending both Ademco High-Speed and Contact ID formats.

Although the (800) Plus service lacks the speed and reliability of the other AlarmNet services, it has proved to be a cost effective solution for those customers who do not require the level of security or whose central stations are not in the wireless coverage area offered by the other AlarmNet services. *Please note that the (800) Plus service does not carry any UL listing.*

VPN Service

Also available to customers with specific needs is a Virtual Private Networking system. Utilizing the AlarmNet-M or AlarmNet-i networks, this specialized equipment allows a central station to uniquely identify up to 64 different lines on one receiver. VPN offers solutions for companies that have acquired multiple systems with existing AlarmNet subscribers, or who need to partition specific customer types by line for accounting or administrative purposes.

AlarmNet-M

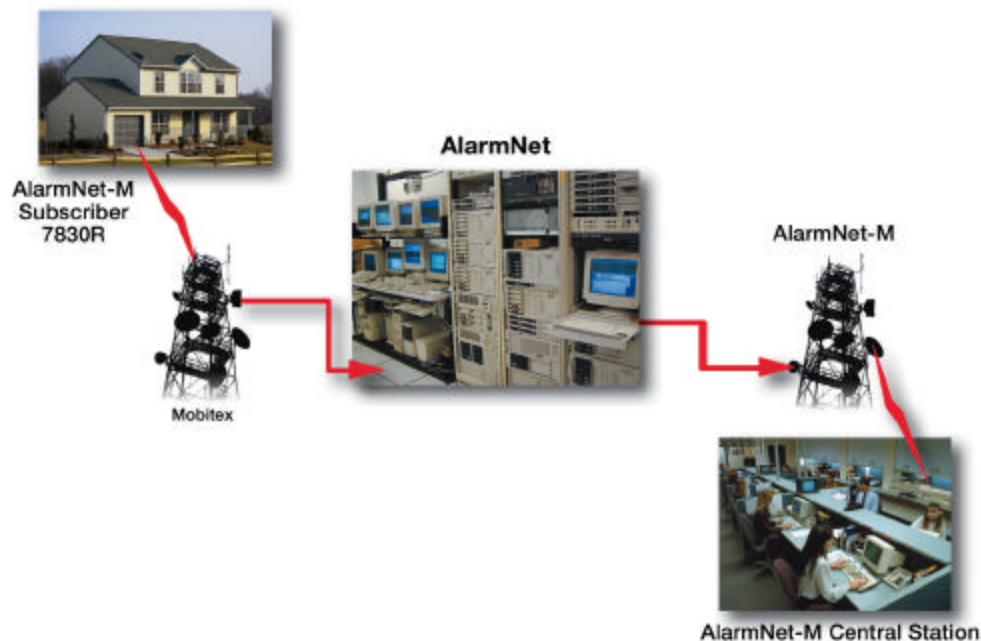
In 1993, to meet a growing demand for greater network coverage, AlarmNet initiated strategic partnerships with commercial radio-network service providers to offer an expanded service that would provide coverage to more than 90% of the U.S. urban population. AlarmNet-M is the name that AlarmNet gave to the service provided by the Cingular “Mobitex” network in the U.S., and the Cantel Mobile Data network in Canada. The AlarmNet-M service is also listed by the Underwriters Laboratories (UL) in the U.S for Line Security, and with ULC in Canada as Level 2.

Alarm messages originating in AlarmNet-M coverage areas are routed to AlarmNet and then on to their central station destination. The alarm is presented to the central station automation system in a standard format through the central station receiver. The end-to-end communication is accomplished in a few seconds. AlarmNet-M supervises the radios with supervision windows of 5 minutes or 24 hours depending on the service selected.

How AlarmNet-M Works

AlarmNet-M, the Mobitex network, is a radio network with approximately 900 network towers and growing. All facilities and communication links are remotely monitored around the clock. The networks are based upon a hierarchical architecture comprised of intelligent network towers and switches. This distributed intelligence enables networks to route messages through the shortest path for increased speed and reliability. Each area has from 10 to 30 channels with ample capacity to serve millions of subscribers. AlarmNet supervises its radios with supervision windows of 5 minutes or 24 hours depending on the service selected. Alarm messages originating in AlarmNet-M coverage areas are routed to AlarmNet and then on to their central station destination. This end-to-end communication is accomplished in a few seconds, and the alarm is presented to the operator in a standard format.

AlarmNet-M



AlarmNet-A

AlarmNet-A is the original group of regional area wireless networks that are owned and operated by AlarmNet. AlarmNet-A networks operate in 19 greater metropolitan areas. This footprint covers about 65% of the urban population in the U.S. (AlarmNet-A is not available in Canada). Each area functions independently and is supported by AlarmNet. One radio network is comprised of up to 30 or more radio towers depending on the size and the topography of the coverage area. These towers consist of network nodes and routers that are responsible for transporting alarm signals and network control information. Each network operates on exclusive frequencies in the 900 MHz band. The network is designed with overlapping coverage so that subscriber radios are typically in communication with two or more network towers. The networks are monitored around the clock and the system availability exceeds 99.5%.

AlarmNet-A footprint – 19 greater metropolitan areas:

- | | | | |
|-----------------|-----------------|---------------------------|---------------|
| New York | Philadelphia | Washington DC / Baltimore | Miami |
| Chicago | Houston | Dallas / Ft. Worth | San Francisco |
| Los Angeles | Tampa / Orlando | Atlanta | Detroit |
| Minneapolis | Boston | Phoenix | Las Vegas |
| Portland, Maine | Nashville | Memphis | |



AlarmNet-A
Autonomous network operation

How AlarmNet-A Works

There are two types of AlarmNet-A subscriber radios:

- One-Way radios - these check in at regular intervals
- Two-Way radios – these are polled by the network.

Reliability is assured by repeating alarm transmissions 60 times. The network identifies the radio and the central station to which it belongs. The alarm is then relayed to the central station receiver directly, if it is within the same network, or through AlarmNet if outside that network. The entire process is fully automated and typically takes a few seconds.

In addition to delivering messages from subscribers' premises, the subscriber radios are also supervised so that if a subscriber loses communication with the network, the monitoring station is notified. The supervision window settings are 5 minutes, 6 hours, 24 hours, or 48 hours depending on the service selected. In addition, all message paths are verified by the network to ensure that all alarms are successfully delivered to the central station receiver.

Summary

The AlarmNet suite of services covers a wide variety of technologies and supports a growing number of products for use by central stations and alarm dealers. The main focus of AlarmNet remains to be providing value added services that are in cooperation with central stations and in support of professional installation companies throughout North America. As new technologies come into the forefront, AlarmNet stands ready to incorporate them into its network for the benefit of the security industry.