SPOT THE DIFFERENCE

Alert-iT Care Alarm Technology

PLESIO vs TELE

Discover how **Safelink** plesiocare is far superior to standard telecare protocols for high dependency care

WHY HAS ALERT-IT DEVELOPED A SPECIAL PROTOCOL?

The Alert-iT **Safelink** Protocol is designed for use in a Plesiocare environment, where health and even life protection is involved. It is designed to meet the requirements of a Medical Alarm system, to standard EN60601-8-1 with additional fail-safe features introduced by Alert-it. This provides improved integrity and reliability over Telecare systems using the Social Alarm standard EN50134.

Social Alarms are designed to allow individuals with potentially disabling medical conditions to live or be left alone in their home for short periods. It is termed Telecare because Tele means Remote in Greek and reflects on the use of remote call-centres to receive emergency alarm calls when needed. To ensure an acceptable level of integrity the radio links involved are designed to minimise (but not eliminate) possible interference and blocking. The monitoring equipment has to be autonomous as the protected person has often low understanding of technology.

Hence it must not only detect and transmit the alarm but also detect when to re-arm in order to detect any subsequent new alarm condition rather than block the phone system with a continuing call. This has not always been successful. Hence such alarms should only be used where the probability of a severe medical condition occurring is low. Detecting a fall is a typical use, but only when a fall would not normally be catastrophic provided assistance is provided in a timely manner.

Plesioocare is derived from the Greek word Plesio, meaning local and is the opposite of Tele. In this case the protected individual will probably have a severe medical condition that could lead to a health or life threatening situation and a local carer is required

to ensure prompt action to preserve their health. A typical condition would be severe Epilepsy when often medication has to be supplied within 2 minutes of a seizure starting. No carer is able to supply such vigilance, but with the support of a monitor such a

response is most likely. In this case the alarm system is under the control of a capable carer and can be intelligently reset. However the radio connection cannot just be highly reliable, it must be fail-safe.

Because of these basic differences, Telecare and Plesiocare systems have evolved quite different capabilities and characteristics, which I have summarised in the following table. Alert-it will happily supply further details if required.

Requirement	Telecare	Plesiocare
Frequency	869.2Mhz. This is a heavily utilised frequency for Social Alarms and vulnerable to overload in care facilities. It is also under threat as it is in the middle of the cellphone allocation band desired for 5G and beyond	434.075MHz. This is an open wideband low power channel for scientific and medical use and not heavily utilised.
Robustness	Used Class 1 radio, which reduces vulnerability to interference but not blocking "on frequency". This is rogue transmitters continuously transmitting at the operating frequency of the system. The EMC performance meets EN50130.	The transmitters & receivers meet the requirement of EN300-220 as a Class 2 enhanced by a failsafe protocol to proof against interference and "on frequency" blocking. The EMC performance exceeds the requirements for EN60601-1-2 for Medical Devices in both domestic and healthcare environments; which in itself exceeds the requirements for Social Alarms.
Data Packet	Typically 6180 bits at 2.5kbaud (2.5 sec per packet of 3 messages plus 4 sec dead time between messages). Typical duty cycle 0.1%	40bits at 5k baud (10 sec per packet). First alarm message of 5 data packets, then one packet every 10 seconds. Max duty cycle 0.1%.
Available air time	9-34 alarms per minute. This is ample for the intended use in an individual home.	1100-5500 alarms per minute. This is more than capable of supporting failsafe operation with repeaters in and extended care home or hospital
Range	200m outdoors (with limited extendibility)	450m outdoors (infinitely extendable)
Repeater	Limited due to protocol and lack of air-time	Unlimited. Maximum range to date is 4 miles using? repeaters to cover an extensive care village site.
Failsafe capability	None. The Class 1 radio has good rejection to interference, but not blocking. The response model is also prone to failure	Uses regular heartbeat to prove monitor and radio channel is functional. This regular transmission limits the number of failsafe monitors to 900 in an area (note not all monitors would normally require failsafe operation). If a repeater is used then the maximum number will reduce to 450.
Response	The protocol relies on activation of a telephone or pager by a single burst of alarm packets, which is vulnerable to failed communication. The alarm is cleared by remote reset of the telephone or pager which can lead to false alarm reset with no further alarms being raised.	Alarm signals are sent repeatedly (10 sec) until the monitor is cleared. The alarm can normally only be cleared at the monitor, forcing staff to attend and proving care compliance for the home
Logging	Call centres have a log of successful alarm transmissions. Some pagers will record times (provided the pager clock is kept updated)	A secure logging module in the home provides logged data locally, by email or at a web server.
Topology	Often a central resource is needed (computer or telephone activator) to consolidate the alarms, add location information and call the carer. In a multi-user environment this can lead to whole system failure. Nurse Call systems are particularly vulnerable to this.	All transmissions are direct from monitor to pager with no vulnerable central resource.
Response Filter	The telephone system allows the alarm type to be categorised and the call centre follow a suitable protocol.	As required for EN60601-8-1 individual monitors can have the priority level of the alarm set to ensure the most vulnerable get the fastest response.
Post alarm action	When used with a pager the carer has to use a menu to clear the alarm at the pager. Then they attend the user, with no confirmation of this required.	No action at the pager required (temporary mute is available). Attend the user and press reset button on the monitor.
Battery Life	Requires a substantial amount of power per transmission (time is energy). The long life quoted reflects on only occasional use (eg less than once a day).	The fast data requires little battery energy. Hence 2 AAA batteries will support the failsafe protocol with a transmission every 10 seconds for over 1 year.

The above table serves to show the difference in pedigree between a classical Telecare Social Alarm and the failsafe Plesiocare alarm from Alert-it, designed for medical applications. The former is perfectly suited for monitoring a small number of parameters in a single user's home (eg fall, smoke and panic alarms) where the immediate consequence of the condition is not serious, which allows the response to come from an off-site agency. Plesiocare was designed specifically for highly vulnerable users in a supported environment, often with multiple residents in the home. Extensive features in the radio protocol and the pager capabilities allow for the creating of a secure, high integrity, flexible alarm system. At the same time the only action required of the carer is to attend the user as indicated and press one reset button in the room, which clears the pager, proves attendance and can log the time and response time.