A MONITORING SYSTEM

Field of the Invention

The present invention relates to a monitoring system for monitoring the status of a facility such as an automated teller machine (ATM), and a method of monitoring such a facility.

Background of the Invention

It is known to provide a monitoring system, for example for monitoring the status of an automated teller machine (ATM), of the type wherein in response to detection of an alarm situation at the ATM, an alarm signal is sent to a remote surveillance station. The alarm signal is used at the surveillance station to communicate the alarm situation to an operator, and based on the alarm situation appropriate action can be taken by the operator.

However, current such monitoring systems are relatively unsophisticated, in particular in relation to handling of communication errors between components of the system, since such communication errors commonly necessitate system downtime while the error is identified and rectified.

Summary of the Invention

In accordance with a first aspect of the present invention, there is provided a monitoring system for monitoring the status of a monitored facility, the monitoring system comprising:

an alarm receiver arranged to receive an alarm signal indicative of an alarm situation at ~~a~~ the monitored facility from a facility monitoring device, and to decode the alarm signal to produce alarm data indicative of the alarm situation based on the alarm signal;

a server arranged to receive the alarm data from the alarm receiver and to make the alarm data available to an operator terminal, the operator terminal using the received alarm data to communicate the alarm situation to an operator of the operator terminal;

at least 2 communication paths through which alarm data is able to pass when the alarm data is sent from the alarm receiver to the server, a defined one of the

communication paths being active such that at any time alarm data is communicated through the defined one of the communication paths; and

a switching device arranged to select one of the communication paths as an active communication path to use to communicate the alarm data from the alarm receiver to the server~~,~~;

wherein the server is arranged to communicate an acknowledgement signal to the alarm receiver when the alarm data is received at the server; and

wherein the system is arranged to select an alternative one of the communication paths as the active communication path ~~being selected based on an indication as to whether communications from the alarm receiver are being~~ if the acknowledgement signal is not received at the ~~server~~ alarm receiver.

~~In one embodiment, the server is arranged to send an acknowledgement signal to the alarm receiver when the alarm data is received at the server.~~

In one embodiment, the alarm receiver is arranged to resend the alarm data to the server if an acknowledgement signal is not received at the alarm receiver from the server.

In one embodiment, the system is arranged to ~~produce an indication~~ determine that communications from the alarm receiver are not being received at the server if an acknowledgement signal is not received at the alarm receiver after a defined number of resend attempts, and the switching device is arranged to select an alternate communication path as the active communication path to use to communicate the alarm data from the alarm receiver to the server based on the indication. The defined number of resend attempts may be 3.

In one embodiment, the alarm receiver is arranged to communicate a control signal to the switching device when ~~an indication is produced~~ the system determines that communications from the alarm receiver are not being received at the server, the control signal indicative of which communication path to use as the active communication path.

In one embodiment, the system is arranged to produce an audible and/or visible warning when an indication is produced that communications from the alarm receiver are not being received at the server.

In one embodiment, the system is arranged to send a heartbeat signal between the alarm receiver and the server and to change the active communication path when the heartbeat signal is not received.

In one embodiment, the system includes a network arranged to facilitate communications between the alarm receiver, the server and the communication paths. The network may include an addressable network such as an IP Ethernet type network.

In one embodiment, the alarm receiver is arranged to communicate using RS232 type communications, and the system includes a first network adapter arranged to interface the alarm receiver with the network.

In one embodiment, the switching device is arranged to communicate using RS232 type communications, and the system includes a second network adapter for each communication path, each second network adapter arranged to interface the switching device with the network.

In one embodiment, the system is arranged such that the alarm signal received by the alarm receiver from a facility monitoring device passes through the active communication path to the alarm receiver.

In one embodiment, the alarm receiver, the switching device and the server are disposed at a surveillance station remotely located relative at least one facility monitoring device.

In accordance with a second aspect of the present invention, there is provided a method of monitoring the status of a monitored facility, the method comprising:

receiving at an alarm receiver an alarm signal indicative of an alarm situation at ~~a~~ the monitored facility;

decoding the alarm signal to ~~producing~~ produce alarm data indicative of the alarm situation based on the alarm signal;

communicating the alarm data from the alarm receiver to a server;

making the alarm data available to an operator terminal;

providing at least 2 communication paths through which alarm data is able to pass when the alarm data is communicated from the alarm receiver to the server, a defined one of the communication paths being active such that at any time alarm data

is communicated through the defined one of the communication paths;

communicating an acknowledgement signal from the server to the alarm receiver when the alarm data is ~~producing an indication as to whether communications from the alarm receiver are being~~ received at the server; and

selecting an alternative one of the communication paths as ~~an~~ the active communication path to use to communicate the alarm data from the alarm receiver to the server~~, the active communication path being selected based on the indication~~ when the acknowledgement signal is not received at the alarm receiver.

Brief Description of the Drawings

The present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a block diagram of a monitoring system in accordance with an embodiment of the present invention;

Figure 2 is a block diagram illustrating example functional components of an alarm receiver of the system shown in Figure 1;

Figure 3 is a block diagram illustrating example functional components of a server of the system shown in Figure 1; and

Figure 4 is a block diagram of a monitoring system in accordance with an alternative embodiment of the present invention;

Description of an Embodiment of the Invention

The present monitoring system operates such that one or more facilities are monitored for an alarm situation, and when an alarm situation is detected, an alarm signal is sent to an operator at a remotely located surveillance station. In response to the alarm signal, the operator is able to carry out appropriate action, for example view image and/or video feeds from the monitored facility in order that the operator can assess the alarm situation, and if necessary alert a response team or the police.

Referring to Figure 1, a schematic block diagram of a monitoring system 10 for monitoring one or more facilities 12 according to an embodiment of the invention is shown. In this example, several facilities 12 are monitored and the monitored facilities 12 are automated teller machines (ATM), although it will be understood that the facilities 12 may take the form of any machine, building or location desired to be monitored.

Claims:

The Claims defining the invention are as follows:

1. A monitoring system for monitoring the status of a monitored facility, the monitoring system comprising:

an alarm receiver arranged to receive an alarm signal indicative of an alarm situation at ~~a~~ the monitored facility from a facility monitoring device, and to decode the alarm signal to produce alarm data indicative of the alarm situation based on the alarm signal;

a server arranged to receive the alarm data from the alarm receiver and to make the alarm data available to an operator terminal, the operator terminal using the received alarm data to communicate the alarm situation to an operator of the operator terminal;

at least 2 communication paths through which alarm data is able to pass when the alarm data is sent from the alarm receiver to the server, a defined one of the communication paths being active such that at any time alarm data is communicated through the defined one of the communication paths; and

a switching device arranged to select one of the communication paths as an active communication path to use to communicate the alarm data from the alarm receiver to the server~~,~~;

wherein the server is arranged to communicate an acknowledgement signal to the alarm receiver when the alarm data is received at the server; and

wherein the system is arranged to select an alternative one of the communication paths as the active communication path ~~being selected based on an indication as to whether communications from the alarm receiver are being~~ if the acknowledgement signal is not received at the ~~server~~ alarm receiver.

~~2. A monitoring system as claimed in claim 1, wherein the server is arranged to communicate an acknowledgement signal to the alarm receiver when the alarm data is received at the server.~~

2~~3~~. A monitoring system as claimed in claim ~~2~~ 1, wherein the alarm receiver is arranged to re-communicate the alarm data to the server if the acknowledgement

signal is not received at the alarm receiver from the server.

34. A monitoring system as claimed in claim 3 2, wherein the system is arranged to ~~produce an indication~~ determine that communications from the alarm receiver are not being received at the server if the acknowledgement signal is not received at the alarm receiver after a defined number of re-communication attempts.

45. A monitoring system as claimed in claim 4 3, wherein the defined number of re-communication attempts is 3.

56. A monitoring system as claimed in claim 4 3 or claim 5 4, wherein the alarm receiver is arranged to communicate a control signal to the switching device when ~~an indication is produced~~ the system determines that communications from the alarm receiver are not being received at the server, the control signal indicative of which communication path to use as the active communication path.

67. A monitoring system as claimed in any one of claims 4 3 to 6 5, wherein the system is arranged to produce an audible and/or visible warning when an indication is produced that communications from the alarm receiver are not being received at the server.

78. A monitoring system as claimed in any one of the preceding claims, wherein the system is arranged to send a heartbeat signal between the alarm receiver and the server, and to change the active communication path when the heartbeat signal is not received.

89. A monitoring system as claimed in any one of the preceding claims, wherein the system includes a network arranged to facilitate communications between the alarm receiver, the server and the communication paths.

910. A monitoring system as claimed in claim 9 8, wherein the network includes an addressable network such as an IP Ethernet type network.

1011. A monitoring system as claimed in claim 9 8 or claim 10 9, wherein the alarm

receiver is arranged to communicate using RS232 type communications, and the system includes a first network adapter arranged to interface the alarm receiver with the network.

11~~12~~. A monitoring system as claimed in claim ~~11~~ 10, wherein the switching device is arranged to communicate using RS232 type communications, and the system includes a second network adapter for each communication path, each second network adapter arranged to interface the switching device with the network.

12~~13~~. A monitoring system as claimed in any one of the preceding claims, wherein the system is arranged such that the alarm signal received by the alarm receiver from a facility monitoring device passes through the active communication path to the alarm receiver.

13~~14~~. A monitoring system as claimed in any one of the preceding claims, wherein the alarm receiver, the switching device and the server are disposed at a surveillance station remotely located relative at least one facility monitoring device.

14~~15~~. A method of monitoring the status of a monitored facility, the method comprising:

receiving at an alarm receiver an alarm signal indicative of an alarm situation at ~~a~~ the monitored facility;

decoding the alarm signal to ~~producing~~ produce alarm data indicative of the alarm situation based on the alarm signal;

communicating the alarm data from the alarm receiver to a server;

making the alarm data available to an operator terminal;

providing at least 2 communication paths through which alarm data is able to pass when the alarm data is communicated from the alarm receiver to the server, a defined one of the communication paths being active such that at any time alarm data is communicated through the defined one of the communication paths;

communicating an acknowledgement signal from the server to the alarm receiver when the alarm data is ~~producing an indication as to whether communications from the alarm receiver are being~~ received at the server; and

selecting an alternative one of the communication paths as ~~an~~ the active

communication path to use to communicate the alarm data from the alarm receiver to the server~~, the active communication path being selected based on the indication~~ when the acknowledgement signal is not received at the alarm receiver.

~~16. A method as claimed in claim 15, comprising communicating an acknowledgement signal from the server to the alarm receiver when the alarm data is received at the server.~~

15~~17~~. A method as claimed in claim ~~16~~ 14, comprising re-communicating the alarm data to the server if the acknowledgement signal is not received at the alarm receiver from the server.

16~~18~~. A method as claimed in claim ~~17~~ 15, comprising ~~producing an indication~~ determining that communications from the alarm receiver are not being received at the server if the acknowledgement signal is not received at the alarm receiver after a defined number of communication attempts.

17~~19~~. A method as claimed in claim ~~18~~ 16, wherein the defined number of communication attempts is 3.

18~~20~~. A method as claimed in claim ~~18~~ 16 or claim ~~19~~ 17, comprising communicating a control signal from the alarm receiver to the switching device when an indication is produced that communications from the alarm receiver are not being received at the server, the control signal indicative of which communication path to use as the active communication path.

19~~21~~. A method as claimed in any one of claims ~~15~~ 14 to ~~20~~ 18, comprising producing an audible and/or visible warning when an indication is produced that communications from the alarm receiver are not being received at the server.

20~~22~~. A method as claimed in any one of claims ~~15~~ 14 to ~~21~~ 19, comprising sending a heartbeat signal between the alarm receiver and the server, and changing the active communication path when the heartbeat signal is not received.

21~~23~~. A method as claimed in any one of claims ~~15~~ 14 to ~~22~~ 20, comprising providing a network arranged to facilitate communications between the alarm receiver, the server and the communication paths.

22~~24~~. A method as claimed in any one of claims ~~15~~ 14 to ~~23~~ 21, comprising receiving the alarm signal at the alarm receiver through the active communication path.

23~~25~~. A method as claimed in any one of claims ~~15~~ 14 to ~~24~~ 22, comprising disposing the alarm receiver, the switching device and the server at a surveillance station remotely located relative at least one facility monitoring device.