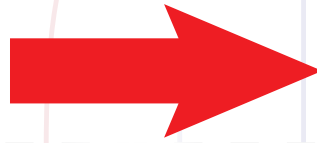# ANALOG to CELLULAR
Making a Remote Management Transition Plan

USR3453C
Courier 56K Business Modem

USR3500
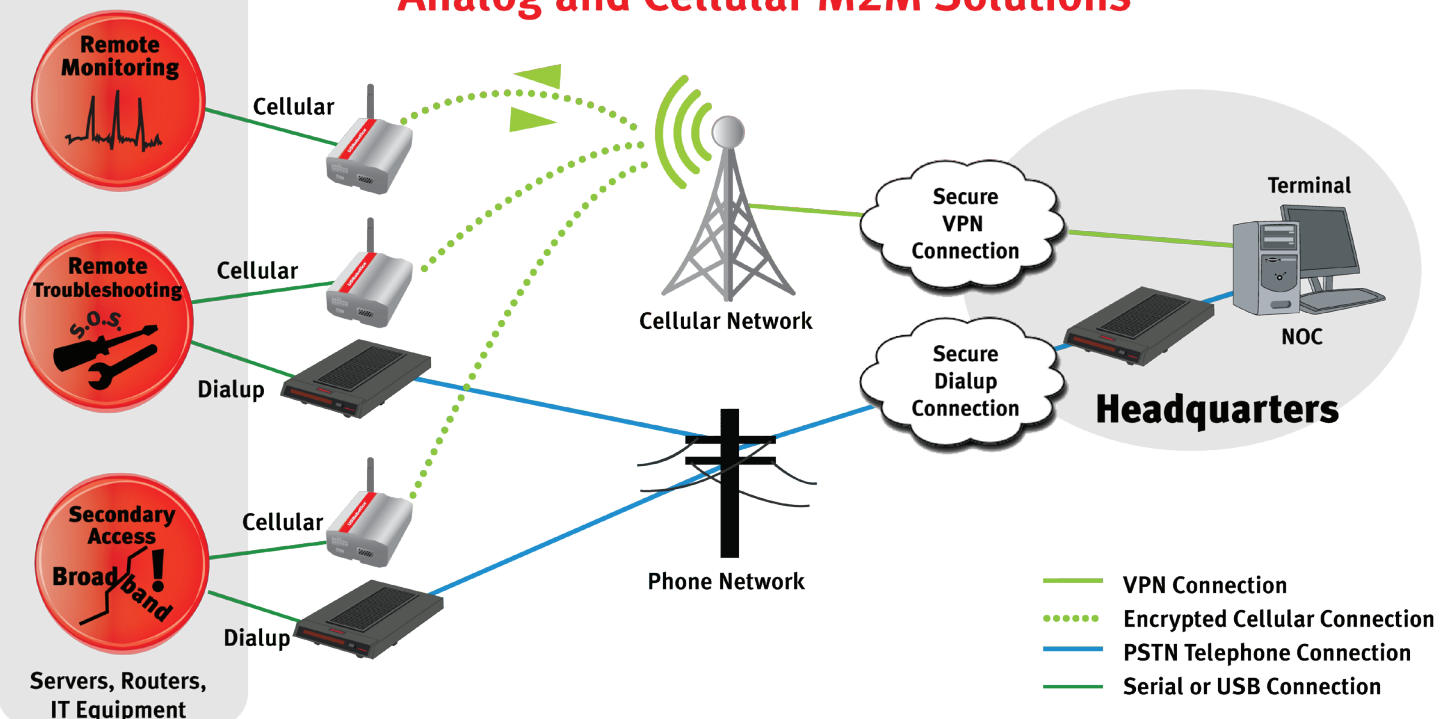**Courier M2M 3G Cellular Modem**

Many M2M customers are considering making the transition from analog to cellular but may not be sure what that entails. This document provides a high level overview of an analog to cellular conversion specifically for a Remote IT Management system that uses analog modems and the public switched telephone network (PSTN).

Original Remote IT Management System - Assumptions

- A centrally-located network operations center (NOC) that contacts dispersed remote networking equipment for the purpose of maintenance and troubleshooting, usually as a back-up to in-band communication.
- Contact is initiated by a human operator at the NOC using a terminal emulation application on a computer workstation.
- The connection is made to the RS232 management port (a.k.a. console port) provided by each piece of remote IT equipment.
- The connection must be immediately available so malfunctioning networks can be remedied in the shortest possible time.

Analog and Cellular M2M Solutions

Remote Locations

Remote Monitoring — Cellular

Remote Troubleshooting — Cellular / Dialup

Secondary Access Broadband — Cellular / Dialup

Servers, Routers, IT Equipment

Cellular Network

Phone Network

Secure VPN Connection

Secure Dialup Connection

Terminal

NOC

Headquarters

— VPN Connection
····· Encrypted Cellular Connection
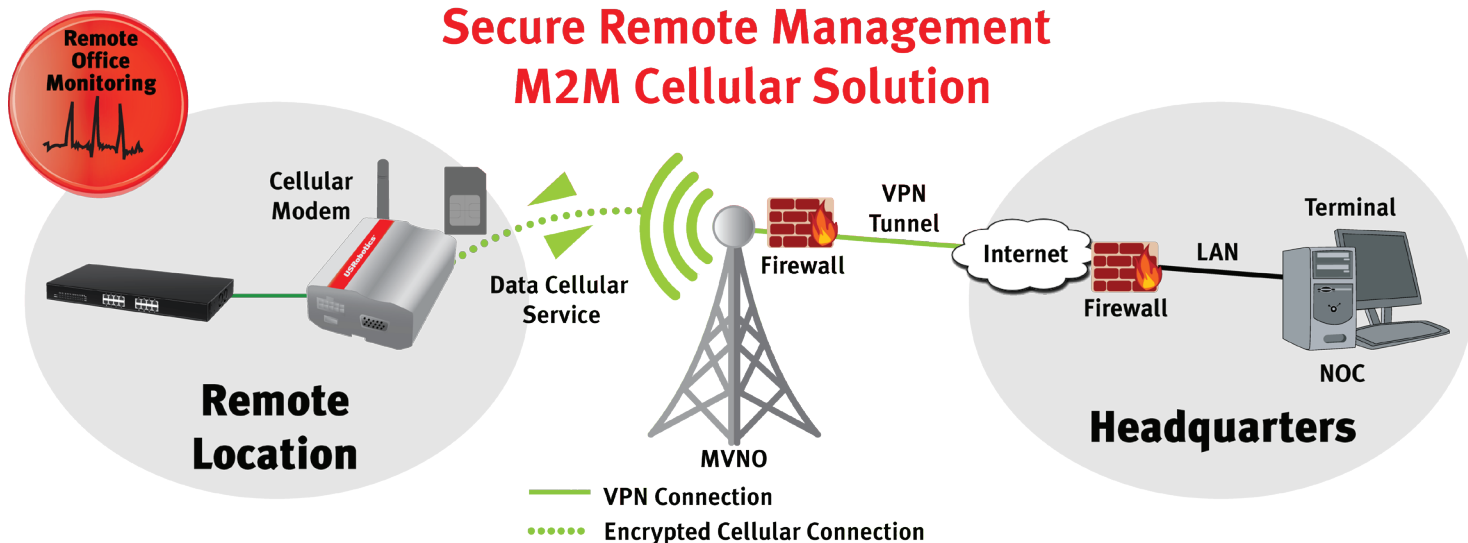— PSTN Telephone Connection
— Serial or USB Connection

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Transitioning From ANALOG to CELLULAR Remote Management

Secure Remote Management
M2M Cellular Solution

Remote Office Monitoring

Cellular Modem

Data Cellular Service

Remote Location

MVNO

VPN Tunnel

Firewall

Internet

Firewall

LAN

Terminal

NOC

Headquarters

—— VPN Connection
······ Encrypted Cellular Connection

Step by Step Transition Process

❶	Obtain a Cellular Modem	USR recomends the USR3500 Courier M2M 3G Cellular Modem due to the ease of setting up persistent connectivity and the reliability it provides.
❷	Find an MVNO	USRobotics can recommend a Mobile Virtual Network Operator (MVNO) to provision the cellular service. MVNOs offer specific services such as private static IP addresses, L2TP or VPN tunnels, and can verify sufficient wireless coverage.
❸	Provision a SIM	The MVNO will provide the SIM and additional required information for its use.
❹	Obtain Smart Terminal Emulation Software	Verify that the preferred terminal emulation software can make TCP/IP connections; legacy software may only provide access to a COM port.
❺	Verify LAN Access	Consult your Network Administrator to ensure that your LAN will allow the workstation to route to the MVNO tunnel.
❻	Obtain MVNO Data Services	Subscribe to a cellular data plan that includes private static IP addresses, L2TP/VPN tunnel, and an appropriate monthly data plan (adjust later based on actual data usage)
❼	Configure the USR3500 for Remote Managment	Using the terminal application, program the APN, bridge and endpoints to connect Telnet to the command parser, and program bridge and endpoints to connect TCP/IP socket to the serial port.
❽	Connect the Modem to Remote Equipment	Connect the USR3500 to your IT equipment, the serial port will now continuously pass data between the TCP/IP socket and serial port and is ready for data transfer.
❾	Access the Remote Equipment via the Modem	Use the terminal emulation application to enter the static IP of the SIM, enter the TCP/IP socket and access is now bidirectional to the equipment.

NOTE: It is strongly suggested to first build a proof-of-concept breadboard.

Component Comparison

	Analog	*Cellular*
One or more local computer workstation(s) at a single NOC location.	X	X
Software requirements for each workstation	Terminal emulation software - textual interface to a COM port	Terminal emulation software - textual interface via a TCP/IP protocol stack to an Ethernet port
NOC Hardware requirements (per workstation)	modem connected to COM port	A Hardware tunnel (Provided by the MVNO) is needed for more than 1 workstation
NOC Services	telephone line	TCP/IP local area network (LAN) at a single NOC location
Remote IT Equipment Interface	RS232 Console Port (Optional Console Port Server for consolidation of phone lines and modems)	RS232 Console Port (Optional Console Port Server for consolidation of phone lines and modems)
Remote IT Equipment Hardware	One modem at each site connected to console port (or port server)	One modem at each site connected to console port (or port server)
Remote IT Equipment Services	One phone line at each site connected to the analog modem	GSM Mobile Network Operator Subscription to packet cellular data services from MVNO L2TP or VPN Tunnel Service from MVNO