

## WHITE PAPER

# Applying Remote Monitoring Solutions to improve Compliance and Efficiency in the Mining Industry

How new technologies can dramatically improve your ability to manage while significantly lowering capital expenditure and operating costs.

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## Abstract

Traditional methods of remote monitoring and control using RTU's and SCADA systems are well entrenched in the Mining Industry. But there is a wave of new technologies available now that have the potential to dramatically change the way we think and act in our endeavours to meet environmental compliance and optimise cost of operations.

These technologies are providing a platform for the complete re-engineering of many business models in many other industries. This paper explores the potential impact that these technologies can have in the Mining Industry, and what the potential benefits can be.

## Introduction

Traditional methods of monitoring and control using PLC's (Programmable Logic Controllers) and SCADA (Supervisory Control And Data Acquisition software) are well entrenched in the Mining Industry.

These traditional technologies were designed for a world of central command and control, tailored for the production environment – not suited to the new distributed world of business imperatives such as:

- Increased Plant Availability
- Reduced environmental impact
- Increased green credentials
- Reduced operating costs
- Reduced manpower resources

This brings into focus current initiatives in the mining industry such as environmental compliance, optimised asset management and energy efficiency, over widening geographic areas.



This requires the application of a new breed of technology overlaying the traditional production systems, that are capable of reaching further to acquire more data, and sending it directly to those in the organisation that require it, all in real time.

This paper explains how this technology is already field proven, available now, and surprisingly affordable.

## Traditional SCADA+PLC

### Features and Limitations:

Traditional SCADA+PLC systems have a few defining features and resulting limitations for the new connected world:

The front end data collection is done by multichannel PLC's that often perform other production functions such as local control logic, and are not ideally suited to

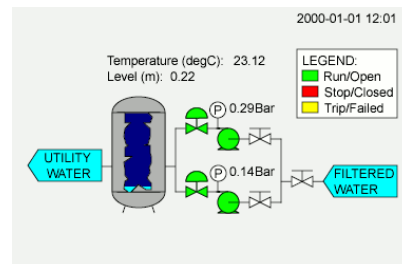
reading specialised instruments, wide area communications and single points of data.

High cost of implementation and power requirements limit their application in wider remote monitoring applications.

The communications network – typically Ethernet, serial or wireless - is privately owned and run by the mine, requiring on site technically trained service staff to keep the infrastructure running.

Due to the high capital cost, the reach of these privately owned networks is limited and often mission critical in the production process, making access for other business functions restricted.

The SCADA back end is an integrated graphics work station (or set of work stations) designed for the use of trained operators in a control room environment.



There is often more than one SCADA system located around each production facility making the consolidation of business data more difficult.

The data collected is stored in on-site databases that require ongoing management and backup, with limited ability to access by other users outside of the control centre.

Data from these production systems is not easily accessible in real-time by operational staff in the field or in the back office where the business decisions are made.

Based upon private infrastructure, these traditional technologies are extremely capital intensive and require significant in-house engineering expertise to specify, procure, manage and maintain.

This traditional infrastructure is well suited for the conventional monitoring and control of production processes such as pumping stations, conveyer systems etc.

For the new imperatives we need a new paradigm.

## The New Requirements

This new set of business imperatives is now putting pressure on management to monitor more and more data in real time, and distribute this to more people in the organisation, also in real time. The current automation infrastructure based upon PLC's and SCADA software is not suited to this task, and it is time to reconsider the business model.



Some examples of these new requirements include:

- Mine water outflow management to ensure discharge meets environmental standards and reporting.
- Other environmental monitoring such as gas, pollution, dust, etc. to meet safety and regulatory requirements.
- Energy monitoring across the site in real time to pin-point wastage and allocate costs.
- De-manning means less dedicated personnel to sit behind computer screens or sit in the office waiting to respond to events. Alarms and Events must be delivered to personnel wherever they may be, doing their normal day jobs.
- Environmental reporting often requires distribution of data to third parties
- External agency requirements such as Flood Warning Systems and pollution reporting require automated linkage to third party systems and to the public.
- Outsourcing of services to vendors requiring off-site vendor managed inventory without compromising in-plant systems.
- Capital constraints and cost recovery imperatives in extending the reach of data monitoring.

## The Technology Barriers

These new requirements provide a number of challenges to the conventional technology:

- Acquisition of data from single points is not cost effective.
- Very wide area coverage is required.
- Limited or no power available at the measurement point.
- Access to specialised measuring instruments is common.
- Large numbers of points spread over a large geographic area
- Access to data by a non-production staff, on and off site.
- Real-time data acquisition required, for use by non-real-time users.

All of these challenges mandate a new way of doing things.

## Taking Advantage of the Connected World

Fortunately we are living in a connected world. Communications is becoming ubiquitous. Power is a bigger challenge today than communications in many of these applications.

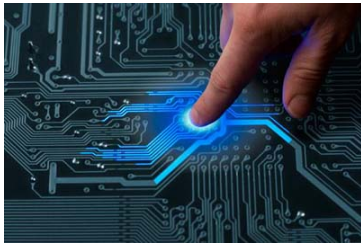


Because of the economies of scale, it is impossible for any organisation to replicate the reliability and coverage of the communications infrastructure available through the publicly accessible networks. The ongoing investment in these networks for data communications cannot be matched by private networks.

There has to be a significant motivation to build this infrastructure yourself. There are times where this may be necessary. A proper risk analysis will determine which pieces of the infrastructure are critical during crisis. This is commonly the traditional private radio network

infrastructure, so it is common to deploy these new technologies alongside the traditional SCADA system, deploying each on its merits.

By embracing the new technologies of the “connected world”, these limitations can be overcome, and this has the potential to radically change the way we manage.



The recent upgrades to the mobile phone network coverage and speed, combined with the internet backbone available, and even the satellite data communications infrastructure available today are creating an extensive and reliable communications infrastructure that is ideal for these applications.

This infrastructure is reaching critical mass. The first wave of users for this technology has been human. The second wave of users, predicted to be bigger than the first, will be machines.

These technologies are providing a platform for the complete re-engineering of many business models in many other industries. This paper explores the opportunities that these technologies can have in the Mining Industry, and what the potential benefits can be.

## How Does it Work?

While the technology of the connected world appears very appealing, selecting the right components to put a system like this together yourself can be a daunting prospect.

That is why Omniflex created the Data2Desktop service.

Data2Desktop is an end-to-end technology framework packaged to you as a simple data service to monitor remote data points, log the data securely on secure cloud based servers and present the data on

demand or by exception to authorised users.

Data2Desktop takes the complexity out of implementing web based remote monitoring, and systems can be implemented in days.

### Step 1:

Deploy an Omniflex Data2Desktop enabled Remote Terminal Unit in the field to monitor your asset.

### Step 2:

Configure the data on the Data2Desktop web portal to suit your requirements.

### Step 3:

Let users log in to the Data2Desktop web portal to view your data.



## Who is Omniflex?

Omniflex has been in the business of remote monitoring in heavy industrial environments for over 40 years, and knows what it takes to design and install equipment to survive the rigors of the mining environment.

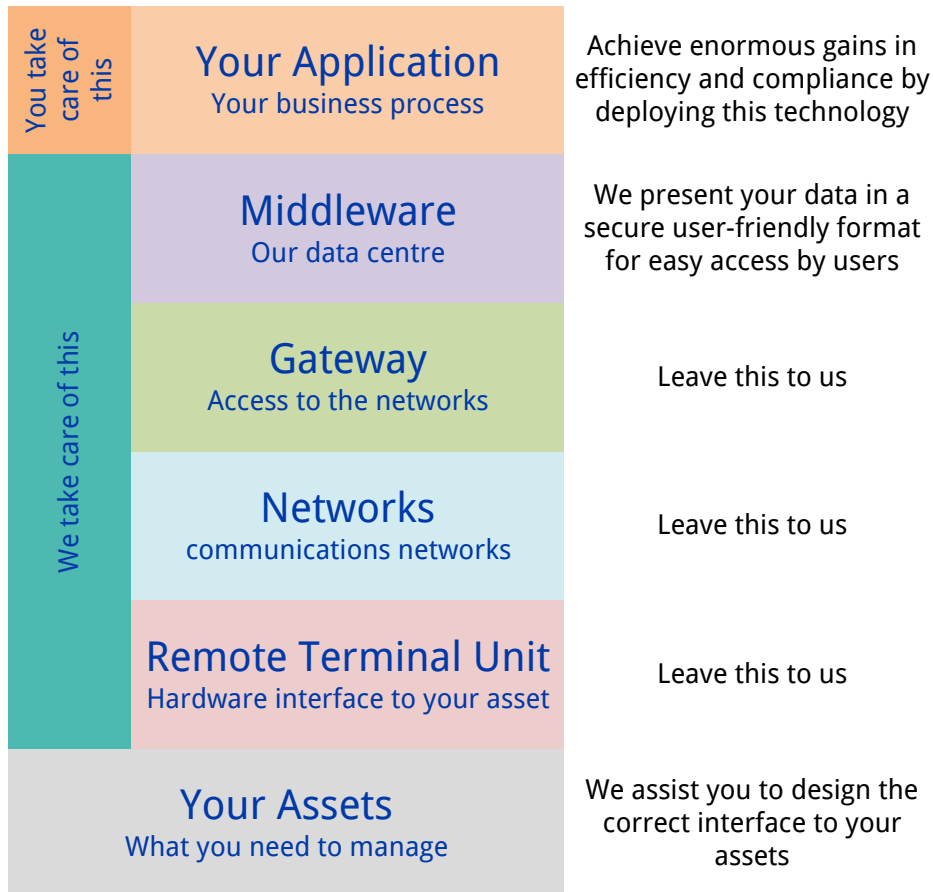
Data2Desktop can use most communications means including mobile phone and satellite networks to send data from remote locations to the Data2Desktop cloud based servers, where the data is stored in your own separate database that we manage for you.

Data on these servers can be accessed by authorised users from any web browser.

Omniflex's radio telemetry systems also provide an ideal front-end for this technology where local telemetry is required to enhance the system.

# The Data2Desktop Technology Framework

## What you need to know



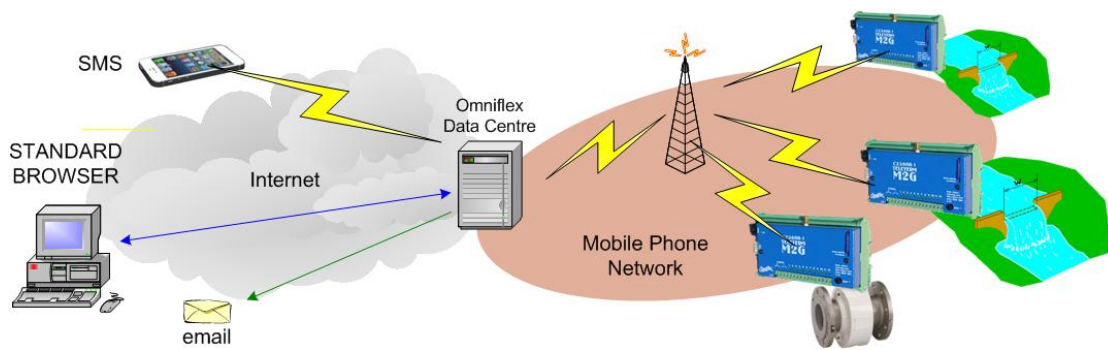
# Typical Applications

## Mine Dewatering Outflow Monitoring and Reporting

Where water is discharged into multiple public waterways, regulations require the ongoing monitoring of water quality and flow-rate, and the regular reporting of this data to the authorities.

This responsibility should fall outside of the production environment. Data should be secure and available for regular, but infrequent reporting, but abnormal events should be reported immediately to prevent pollution and possible fines from authorities.

The use of web-based remote monitoring provides a very convenient method of providing this data directly to the compliance office, without requiring large capital expenditure and access to internal technical resources. By providing a single web-enabled Data Access Point at each outflow location, data can be collected and provided in real-time to the compliance office. In addition, email and SMS alerts can be configured to provide immediate notification if water quality limits are breached.



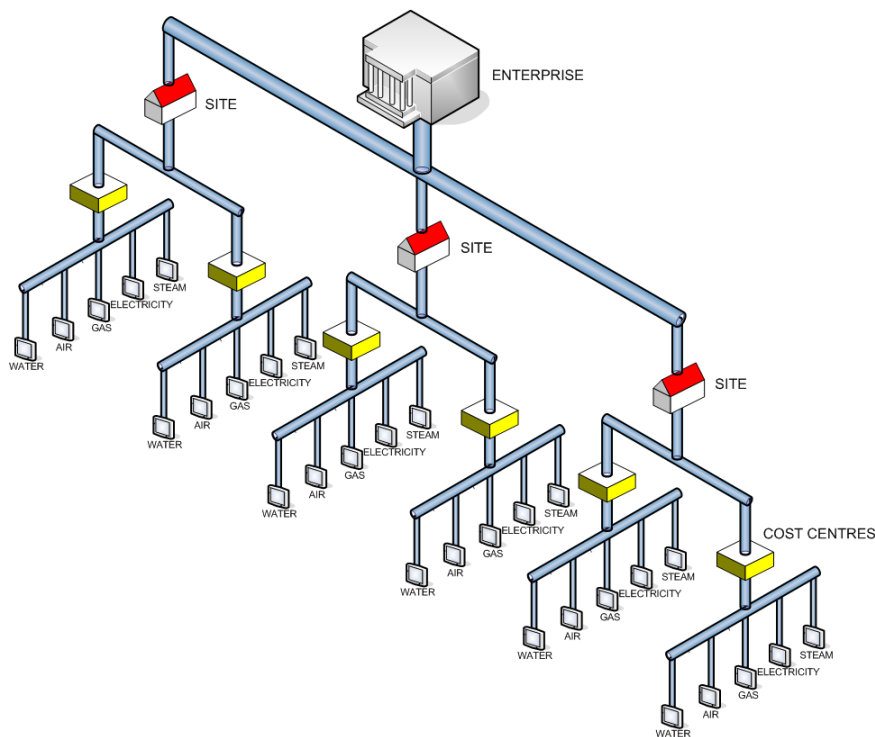
## Utilities Monitoring

For real-time monitoring of energy, and other utilities consumption across all processes, sub-metering of all significant loads is required. By using low cost meters combined with a meter concentrator module in each distribution board or service point, utility consumption in real time can be sent directly to a cloud server such as the Data2Desktop Service operated by Omniflex.

All communications infrastructure, database management and configuration are all handled by Omniflex leaving the user to focus on his business.

Consumption Reports can be accessed directly by accounting staff without the need for involvement by the technical departments.

Exception reporting in real time can be configured to send an email or SMS message to any number of people.

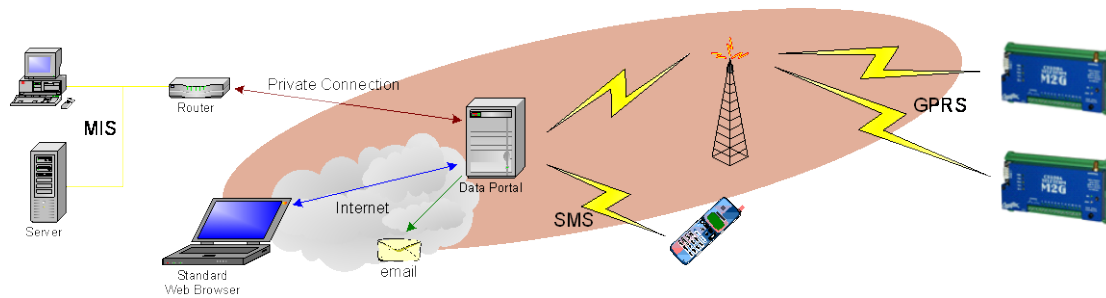




## Portable Plant Inventory Management

Remote monitoring technology can be applied to the logistical management of portable lighting and power plants around a mine site. By tracking the location and operational status of this plant, utilisation of the resource can be optimised.

By using the mobile phone infrastructure, communications can be maintained as equipment is moved around the site. In addition, by using GPS location techniques, the exact location of equipment will always be known. Running/stopped status as well as load data can be obtained. Other assets such as diesel tank levels can also be monitored for better inventory management.



## Conclusions

The use of new technologies in the connected world is inevitable, as it provides the best-in-class means today of communicating with thousands of points securely and cost effectively.

Working alongside traditional SCADA, the new imperatives of the connected world can be achieved without the large capital outlays that were the hallmark of the previous technology projects.

With end-to-end services like Data2Desktop from Omniflex, you do not need technical staff on your team to implement this technology.

Taking advantage of this infrastructure to accomplish the additional management tasks of remote asset management as a

compliment to your existing SCADA system can lead to fast implementations with surprisingly low capital outlay and running costs.

**Omniflex is a technology leader in remote monitoring for industrial applications.**

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