CONET

TELEMETRY AND DATA ACQUISITION

PLANT WIDE DATA MONITORING

REMOTE I/O SYSTEMS

RTU SYSTEMS

Omniflex

AUTOMATION PRODUCTS

Corporate Overview

**a name
synonymous
with quality**

OMNIFLEX has been designing and manufacturing electronic products and systems for the automation and control industry since 1965.

Through our world-wide partner network, we specialise in providing solutions to industry in the fields of Remote I/O, RTU's, Data Acquisition, Alarm and Event Management, and Process Signal Conditioning Systems.

More than three decades of experience in innovating products and systems such as these have resulted in a refined range of solutions for managing abnormal and critical events in industrial processes. These proven solutions are being relied upon every hour of every day by major corporations around the world.

Whether it's four points or four thousand points, there is an OMNIFLEX solution to your need. Hallmarks of these solutions are reliability, flexibility and ease of use, which synergise to become the trusted eyes and ears of many enterprises, peak performing 24 hours a day collecting data, analysing logical circumstances and providing the appropriate warnings to personnel and other systems.

Building on proven technologies, OMNIFLEX continues to research and develop new frontiers to create products that outperform expectations and provide true added value. Recognising that productivity, human safety and profitability depend largely on products such as these, reliability engineering assumes paramount importance to ensure operation under the most arduous and inhospitable conditions.

An investment in products that carry such a large responsibility requires confidence in our track record and the continued expansion of some of the worlds giant industries using OMNIFLEX technologies, is sufficient testimony to this support.

Don't ask us - ask our loyal customer base.

www.omniflex.com
*your link to powerful solutions in
Industrial Information Technology*

Getting the most from your communications infrastructure

It is true that plant communications technology has advanced dramatically in the last decade. The range of instrumentation capable of being networked grows by the day. The importance of this technology can be seen by the advance of standards for communications – and the number of these standards available, each offering a different unique set of features.

What is not true is that it is easy to connect these disparate instruments and networks into a unified infrastructure, to make the information available timeously at the points where it can most advantageously be used.

Most major suppliers are keen to sell the total solution, but the fact is, that unless it is a greenfield site, the goal of accomplishing this from a single source, economically, remains elusive.

Practicality dictates that you are stuck in most cases with a legacy infrastructure that needs to be optimised. To build on to what you've already got – proven processes, and an existing investment producing quality assured products.

So is it possible to create a strategy that keeps the good and adds an infrastructure to take advantage of the promise of networking – plant-wide and economically?

The strategy is CONET – a uniquely positioned communications infrastructure designed to blend the many communications standards into a network of networks - an inter-networking technology that integrates standard networks into a unified plant-wide I/O and information system.

And when you run out standards, the rugged CONET network can fetch data up to 10km away on existing cables – making possible the integration of systems not thought feasible.
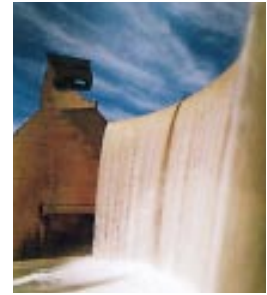
CONET offers possibilities:
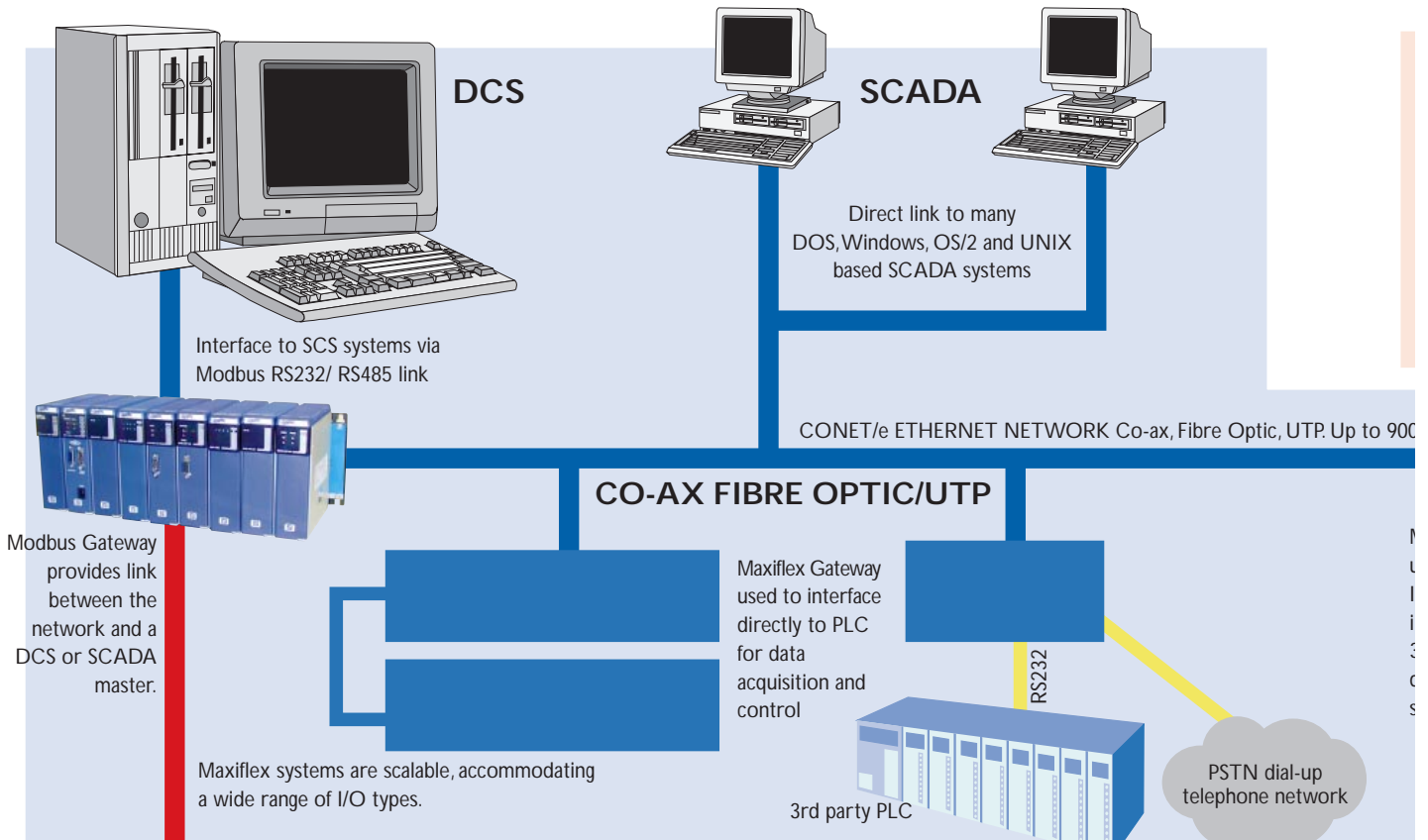
Whether your systems are built upon:

- An Ethernet backbone
- A plant-wide DCS system
- A standardised PLC control systems policy
- One (or more) of the Fieldbus standards.

Or just the challenge of getting I/O information to/from hard to reach locations, CONET technology, implemented on the MAXIFLEX platform range, offers a solution.
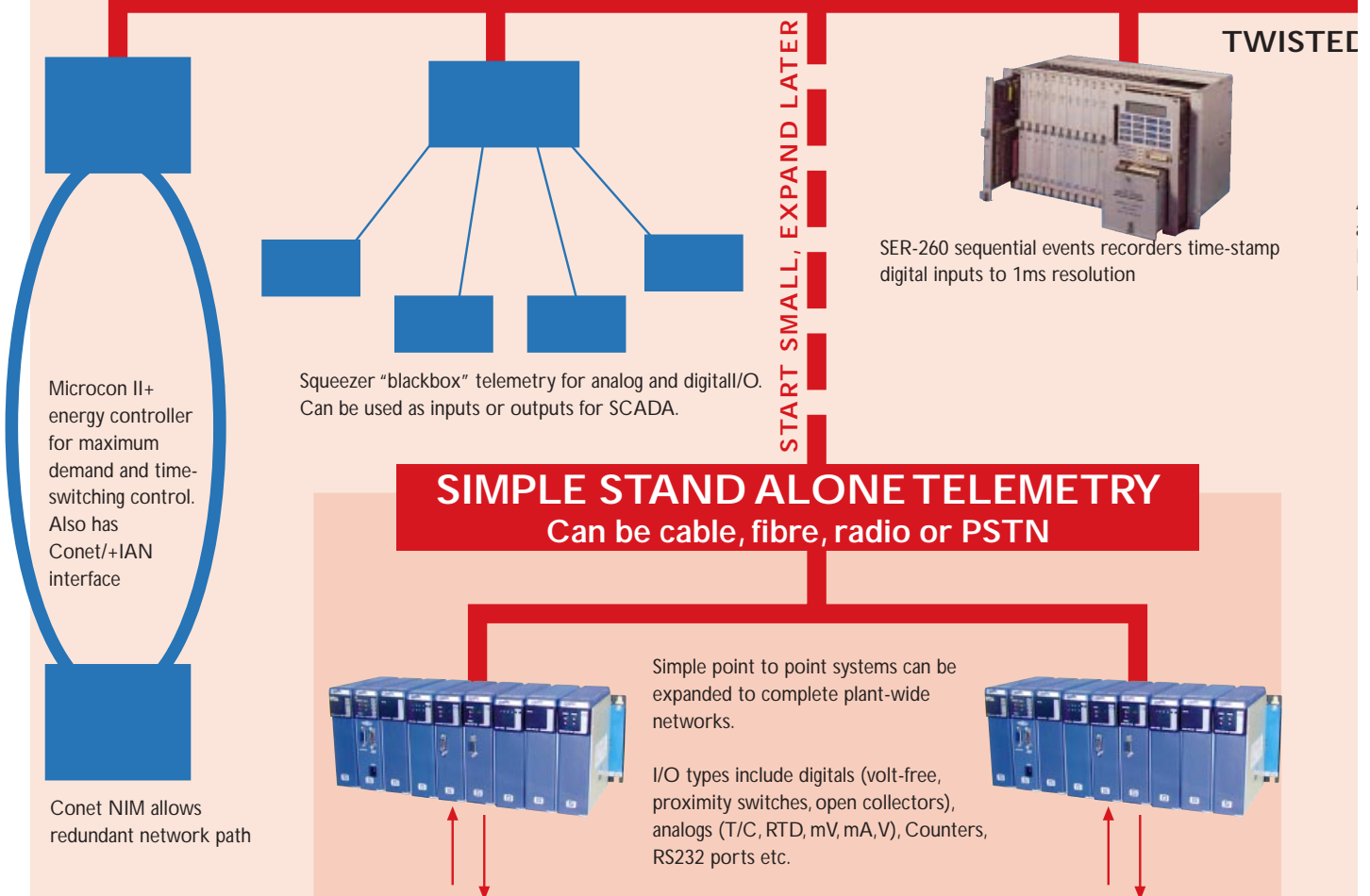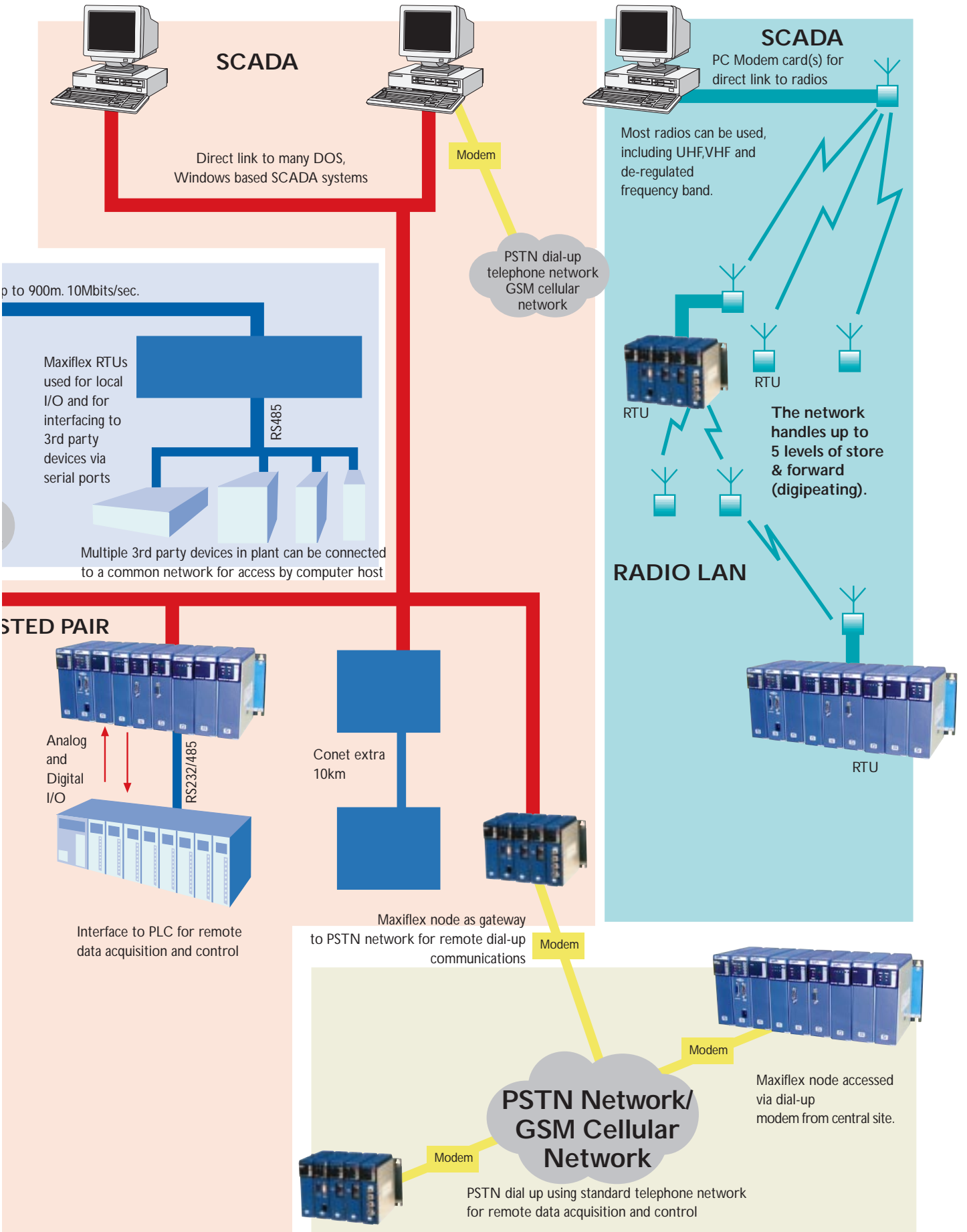
CONET - making the Total Solution a reality!

DCS

SCADA

Direct link to many
DOS, Windows, OS/2 and UNIX
based SCADA systems

Interface to SCS systems via
Modbus RS232/ RS485 link

CONET/e ETHERNET NETWORK Co-ax, Fibre Optic, UTP. Up to 900

CO-AX FIBRE OPTIC/UTP

Modbus Gateway
provides link
between the
network and a
DCS or SCADA
master.

Maxiflex Gateway
used to interface
directly to PLC
for data
acquisition and
control

RS232

Maxiflex systems are scalable, accommodating
a wide range of I/O types.

3rd party PLC

PSTN dial-up
telephone network

Conet Field Bus Network. Twisted Pair. Up to 10km. 62,5kbits/sec

TWISTED

START SMALL, EXPAND LATER

SER-260 sequential events recorders time-stamp
digital inputs to 1ms resolution

Microcon II+
energy controller
for maximum
demand and time-
switching control.
Also has
Conet/+IAN
interface

Squeezer "blackbox" telemetry for analog and digitalI/O.
Can be used as inputs or outputs for SCADA.

SIMPLE STAND ALONE TELEMETRY
Can be cable, fibre, radio or PSTN

Conet NIM allows
redundant network path

Simple point to point systems can be
expanded to complete plant-wide
networks.

I/O types include digitals (volt-free,
proximity switches, open collectors),
analogs (T/C, RTD, mV, mA, V), Counters,
RS232 ports etc.

SCADA

Direct link to many DOS,
Windows based SCADA systems

Modem

PSTN dial-up
telephone network
GSM cellular
network

SCADA
PC Modem card(s) for
direct link to radios

Most radios can be used,
including UHF,VHF and
de-regulated
frequency band.

up to 900m. 10Mbits/sec.

Maxiflex RTUs
used for local
I/O and for
interfacing to
3rd party
devices via
serial ports

RS485

Multiple 3rd party devices in plant can be connected
to a common network for access by computer host

RTU

RTU

**The network
handles up to
5 levels of store
& forward
(digipeating).**

RADIO LAN

STED PAIR

Analog
and
Digital
I/O

RS232/485

Conet extra
10km

RTU

Interface to PLC for remote
data acquisition and control

Maxiflex node as gateway
to PSTN network for remote dial-up
communications

Modem

Modem

Maxiflex node accessed
via dial-up
modem from central site.

PSTN Network/
GSM Cellular
Network

Modem

PSTN dial up using standard telephone network
for remote data acquisition and control

Bases

Maxiflex Bases are available in various sizes from 2 I/O module capacity up to 7I/O master bases with expander base options to accommodate up to 8 more I/O modules. Expansion bases allow up to 15 I/O modules to be connected to a CPU. Each base has two reserved slots - one for the PSU and one for the CPU, the remaining slots are freely available for Maxiflex I/O modules

PSUs

A range of Power Supply modules cater for AC, DC and even solar Powered applications with battery charging capability. Many of the power supplies offer an isolated field supply for contact wetting or loop power. All power supplies have diagnostic LED status indicators behind translucent deadfront covers.

CPUs

CPUs are available for many different applications. Network requirements such as Conet for twisted pair fieldbus networking, Conet/m for radio networking, Conet/e for ethernet media dictate a different model of CPU. All CPUs offer programmable Modbus and Conet/s Ports as options in addition to Local Area Network options. Conet/s facilitates the use of digital radio or fibre optic links. Maxiflex CPUs have event based architectures, having the ability to generate time stamped events via the Network for Supervisory systems. Application specific CPUs are used to cater to "Plug and Play" Telemetry systems or Distributed Alarm Annunciation. Battery backed memory and real time clocks are standard to all CPUs.

Digital I/O

Maxiflex digital I/O is available in module capacities of 8, 16, 32 I/O suited for various different applications. Isolation is typically 1500Vac rms making use of optical isolation techniques. Input modules generally cater for potential free inputs or 10 to 30Vdc or 30 to 60Vdc. A special purpose 8 channel input module is available with inter-channel isolation and the capability to withstand inputs up to 200Vdc for dc series contact chain monitoring applications. Digital output modules generally use NPN open collector transistor outputs or N/O relay contacts

Analog I/O

Maxiflex Analog Input Modules ranges from 8 or 16 channel modules with individually isolated channels or the use of common return lines. For temperature measurement both RTD and thermocouples are accepted directly on input to programmable modules which linearize and convert the mV or resistance input directly to temperature. The input modules cater for all instrumentation signals ranges. The Analog output module provides 8 current loop outputs.

NIMs

Network Interface modules provide a number of vital functions ranging from off loading communications tasks from the CPU, allowing various different network topologies to be created e.g. Star and Bus combinations, Internetworking, third party device/communications interfacing (custom protocols) and redundant networks links. Dedicated NIMs have been developed to communicate with other proprietary equipment like Gas Chromatographs and Analytical equipment in chemical plants. HART Protocol Smart devices can be integrated into Maxiflex/Conet applications using a dual Hart NIM.

Special Function

A number of special function modules have been created to support Maxiflex/Conet applications. High Speed counter modules allow pulses up to 50kHz to be captured. Memory modules with a 1 Megabyte capacity are used to store data or events in RTU applications.

Conet Servers

OPC/DDE servers for Conet Fieldbus Networks allows the Maxiflex event stream to be processed by any OPC client system. (SCADA/DCS/MES or database) thus facilitating the use of state of the art database analysis and reporting tools. The Omniflex philosophy of "Time stamp at source" eliminates all network latency providing chronologically correct data over the entire distributed system.

Programming and Management Tools

Maxiflex has traditionally been programmed in EziForth a high level language because of its flexibility as a programming language and operating system and its efficient fast running interactive ability. An Omniflex adaptation of EziForth allows the user to program in a statement list environment called EziList for those users more comfortable with this form of programming. The latest generation CPUs will also support IEC601131 programming language as an option allowing a full Windows style environment with drag and drop tools and multi-language programming support.

Remote programming over the Conet network has always been a Maxiflex standard offering greater flexibility to plant engineers wishing to make changes in the plant situation. A suite of Windows based Conet utilities and programming/configuration tools allows Network node viewing and configuration of Maxiflex nodes anywhere in the plant via PC stations.
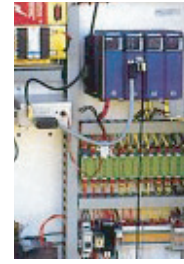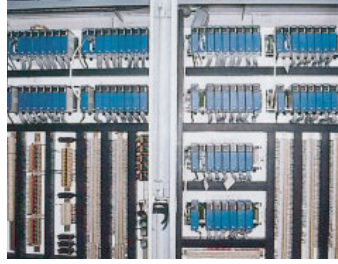
PMRTU -
Pole Mounted Remote Terminal Units

Maxiflex has been used in Low Voltage Electrical Distribution and Reticulation systems for Breaker monitoring and control. RTUs are mounted on poles countrywide in the harshest conditions controlled and monitored via radio networks from a central control station.

High Density Analog Data Acquisition

Maxiflex was used for data collection of hundreds of temperatures from Power station generating sets and transmitted back to process computers via low cost twisted pair cabling. Conet Networking saves on cabling costs while Maxiflex saves on signal conditioning by providing the process computers linearized, compensated temperatures in either degrees C or F.

Cathodic Protection System

Maxiflex is used to monitor reference half-cells for remote monitoring of impressed current cathodic protection systems using high impedance input modules designed specifically for the application where continous monitoring of half-cells requires an ultra high input impedance. Combining with the Powerterm Transformer Rectifiers gives a cathodic protection system capable of remote monitoring and control via the Omniflex Data2Desktop web-based data service. No additional specialised software is required as monitoring and control is done via a standard web browser logging into the secure Data2Desktop Data Centre.
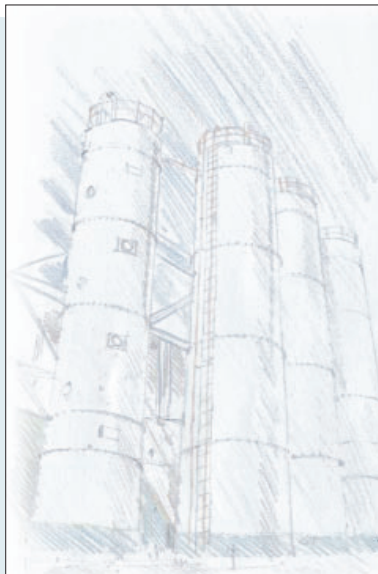
Remote I/O for DCS systems

Maxiflex has been used to collect remote plant data from analytical equipment used to enhance the dynamic control performance of a petro-chemical plant DCS system. Utilizing Network Interface Modules (NIMs) Maxiflex extracted data from Gas Chromatographs and Analyzers providing in addition remote control for stream selection and transmitted all data back to the DCS via Conet Networks. The DCS/Maxiflex interface adopted a Modbus Protocol for data transfer off the Conet Network as this was readily available on the DCS system.

Substation Energy Meter
Data Acquisition

Maxiflex was used to connect 27 Intelligent Energy Management Monitoring systems fitted to various electrical substations distributed around a large manufacturing plant. All the energy parameters measured by the metering devices were required on a SCADA system in a central control room. Due to the distances between substations and cost of cabling the system used an existing Conet Network running on twisted Pair to connect all the substations to the SCADA system. Maxiflex utilized its programmable RS485 Port to connect multiple Energy Meters with Modbus protocol to the Conet Network.

Data Acquisition with time
stamped events

Maxiflex was used to collect plant data for SCADA however Sequence of events was important for trip shut down diagnostics. Maxiflex with a "Time stamp at source" philosophy eliminated Network latency and provided an event stream to a SCADA database that could be sorted chronologically for trip diagnosis. Using a CONET OPC server any OPC client can access time stamped event data packing it into a database. A plethora of sophisticated analysis tools are available to process the data for analysis and reporting.

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