DIN RAIL SIGNAL CONDITIONERS, WITH TFML...

MEDACS

> SMART CONFIGURABLE

> SINGLE CHANNEL OR DUAL CHANNEL

> DISPLAY OPTIONS

> GALVANIC ISOLATION

> UNIVERSAL OR FREQUENCY INPUT

> HIGH PACKING DENSITY

> EASILY CUSTOMISED VIA TFML

> UNIQUE 'BUS JUMPER' SYSTEM

> 10 YEAR WARRANTY

INTRODUCTION

The MEDACS is a totally new concept in DIN rail signal conditioning and consists of a family of DIN rail modules, each one having a high degree of functionality and configurability via a RS485 MODBUS serial communications interface. They accept all common signals and produce an isolated (4 to 20) mA re-transmission signal, a single changeover trip relay, twin normally open relays or various combinations.

For high density systems, dual channel versions are available or for systems that require more local input, single channel versions with an in-built keypad and digital display are available where functions can be accessed via the front panel keys.

Each unit comes complete with a RS485 serial communications port which enables the devices to be integrated into a complete process control system. Unit wiring is simplified and speeded up by using the integral 'bus jumper' system provided with each unit which removes the need for complicated and expensive back plane wiring.

The functionality is further enhanced by the inclusion of a Transfer Function Module Library (TFML) which enables complex transfer functions to be loaded into the device. These can be PID Control, tank linearisation curves, signal accumulators, maximum and minimum data logging etc. all of which can be downloaded from our website www.status.co.uk Alternatively custom functions can be generated to match your specific application and multiple devices can be grouped together to provide solutions for complex applications requiring more variables.

TRANSFER FUNCTION MODULE LIBRARY (TFML)

TFML has been designed to offer the user enhanced power and flexibility by providing a mechanism whereby each unit can be customised to perform a particular function.

Common Macros are listed below and are available from our web site. They are simply down-loaded into the MEDACS unit. Here are some of the TFML Macros currently available:

USER LINEARISATION CHARACTERISTICS
Cylindrical tank characteristic

TRANSFER FUNCTION MODULE LIBRARY PROGRAMS
PID function block for current re-transmission
PID function block for relay
Rate of change limiter
Peak Pick/Hold
Valley Pick/Hold
(A + B)/2
A - B
Sensor Validation

Wires to Power and communications to one connector are Bussed to all.

'BUS JUMPER'

STATUS INSTRUMENTS

Single Channel
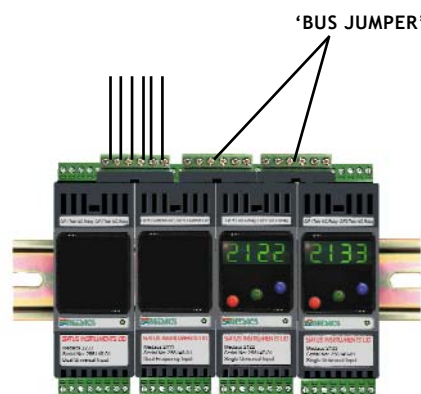
Dual Channel
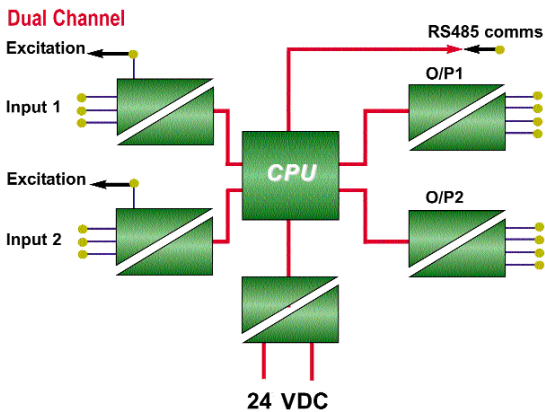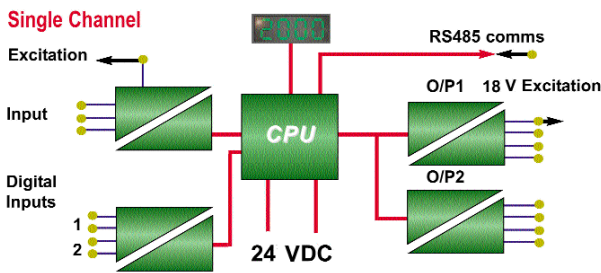
SPECIFICATIONS @ 20 °C

INPUTS

UNIVERSAL INPUT OVERVIEW

SENSOR	RANGE
mA	(4 to 20), ± 20, ± 10
RTD	Pt100, Ni120
TC	K, J, T, R, S, E, N, L, B
Volts	± 0.1, ± 10, ± 1, ± 5, (1 to 5) Slidewire*

CURRENT INPUT

Base Accuracy	0.05 % FS ± 0.05 % of reading
Thermal Drift	0.02 %/°C
Input Impedance	20 Ω
Linearisation	Linear, Square root, Power $^3/_2$, Power $^5/_2$, Custom

Two isolated and regulated 19 V power supplys are available to power the current loops, and are capable of sourcing 25 mA for each channel.

RTD

Sensor Range		(-200 to 850) °C
Linearisation		BS EN 60751/JISC 1604/Custom
Basic Accuracy		0.1 °C ± 0.0 5% of reading
Thermal Drift	Zero	± 0.004 Ω/°C
	Span	0.01 %/°C
Excitation Current		1 mA
Lead Resistance Effect		0.002 °C/Ω
Max. Lead Resistance		50 Ω/leg

THERMOCOUPLE

TYPE	RANGE (°C)
K	-200 to 1370
J	-200 to 1200
T	-210 to 400
R[1]	-10 to 1760
S[1]	-10 to 1760
E	-200 to 1000
L	-100 to 600
N	-180 to 1300
B[2]	-10 to 1650
Custom	-1999 to 9999

Accuracy	± 0.04 % FS ± 0.04 % reading or ± 0.5 °C, whichever is greater
Linearisation	BS 4937/IEC 584-3/Custom
Cold Junction Error	± 0.5 °C
Cold Junction Tracking	0.05 °C/°C
Cold Junction Range	(-20 to 70) °C
Thermal Drift Zero	4 μ/°C
Span	0.02 % /°C

*NOTES:
1   Accuracy true for (800 to 1760) °C
2   Accuracy true for (400 to 1650) °C

VOLTAGE INPUT

Range	± 100 mV, ± 1 V, ± 5 V, ± 10 V, (1 to 5) V
Accuracy	0.04 % FS ± 0.04 % of reading
Thermal drift	0.02 %/°C
Input impedance	1 MΩ
Linearisation	Linear, Square root, Power $^3/_2$, Power $^5/_2$, Custom
*Slidewire	3 wire Potentiometer inputs can be accommodated between 50 Ω & 10 KΩ

FREQUENCY INPUTS

A wide range of input types and frequencies can be accommodated without the need for Switches or Jumpers. Totalise functions are a standard feature on the single channel version and are stored during power down.

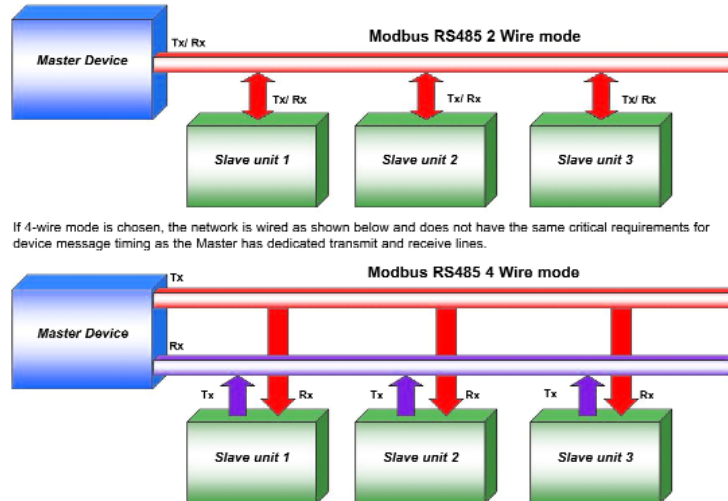|	
Input Types	Namur, low Voltage (> 10 mV), TTL, Open Collector, PFC
Frequency range	0.1 Hz to 20 kHz.
Accuracy	0.003 % FS

DIGITAL INPUTS

Single channel units can also accept two external digital inputs which can be TTL, Open Collector, 24V DC Logic or Potential Free Contacts. Dig 1 is dedicated to a reset/clear function enabled by the configuration software whilst Dig 2 is reserved for use with TFML. Both digitals can be read via the communications and used to signal events.

OUTPUTS

Two output option types are available per channel, relay or current re-transmission. The configuration of these will vary depending upon whether they are fitted on the single or dual channel transmitter.

STATUS INSTRUMENTS

If 4-wire mode is chosen, the network is wired as shown below and does not have the same critical requirements for device message timing as the Master has dedicated transmit and receive lines.

CURRENT RE-TRANSMISSION OUTPUTS

Output Range	
Single Channel	(0 to 10) mA, (0 to 20) mA, (4 to 20) mA source or sink
Dual Channel	(4 to 20) mA sink
Maximum Current Output	< 23 mA
Accuracy	0.07 % or 5 mA, whichever is greater
Max. Power Supply	30 V (in Sink mode)
Temperature Stability	5 µA/°C

*Note: Maximum source load 750 R

RELAY OUTPUTS

Two relay options are available, either a single changeover or twin independent relays with Normally closed contacts.*1

Alarm Action	Off, High, Low, Deviation, Test
Hysteresis	Programmable (0 to 100) %
Delay Time*2	Programmable
Start-up Delay	Programmable

	AC	DC
Max. Switching Voltage	48 V RMS	48V
Max. Current	1 A @ 48 V	1 A @ 30 V
Max. Power	60 VA	30 W
Contact Resistance	< 100 MΩ	
Operate Time	< 5 ms	
Electrical Life @ Full Load	100 000 operations	
Mechanical Life	10 000 000 operations	

*NOTES:
1 Contacts are Normally Closed i.e the contact is closed at power off and when operating in an alarm condition. The contact opens in the absence of an alarm condition. The active function can be reversed in software.
2 Alarm must be continuously present for this period in order to be recognised

GENERAL

Response Time	300 ms
Filter	Programmable or Adaptive
Power Requirements	24 VDC ± 10 % @ 200 mA
Breakdwon Isolation	1 kV I/P~O/P~PSU
Ambient Operating Range	(-30 to 60) °C
Ambient Storage	(-50 to 85) °C
Ambient Humidity	(10 to 90) % RH
EMC Emissions	BS EN61326
EMC Immunity	BS EN61326
Display Range	-1999 to 9999

SERIAL COMMUNICATIONS

Each MEDACS 2000 module comes supplied with RS485 serial communications using MODBUS rtu protocol as standard.

Baud Rate	19.2 kB, 9.6 kB or 1.2 kB
Mode	2 wire or 4 wire available
Device Address	Network unique address 1 to 255

(*NOTE: that maximum device no. for Modbus is 247)
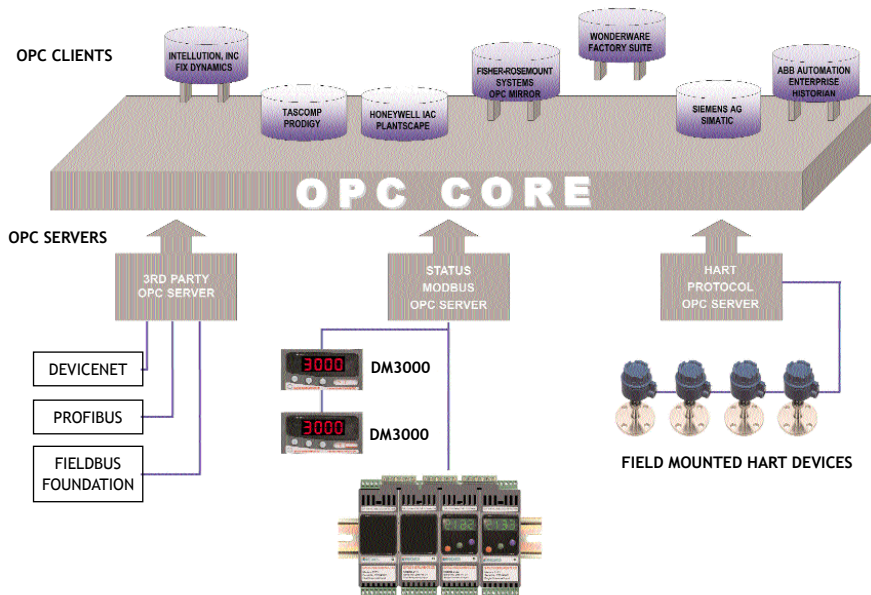
MODBUS

Modbus is a Master-Slave based communications protocol. This means that all messages are initiated by the Master device. In general the Master will communicate with one Slave device at a time, although it is possible under certain circumstances for the Master to broadcast to the entire network. The MEDACS units are Slave devices.

The RS485 mode determines the way that the network is connected together. The 2-wire arrangement, shown above, has both transmit and receive signals sharing the same wires. Although this makes most efficient use of the connections and makes wiring simpler, correct operation depends upon critical timing within the Master device.

DEVICE ADDRESSES

Each Slave unit requires a unique address. If two units have the same address on the network, both will respond when this address is accessed by the Master and a data corruption will result. Modbus defines a maximum address number of 247, but the electrical characteristics of RS485 limit the number of devices on a network to 32; however, buffering the network increases this number.

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OPC CLIENTS
- INTELLUTION, INC FIX DYNAMICS
- TASCOMP PRODIGY
- HONEYWELL IAC PLANTSCAPE
- FISHER-ROSEMOUNT SYSTEMS OPC MIRROR
- WONDERWARE FACTORY SUITE
- SIEMENS AG SIMATIC
- ABB AUTOMATION ENTERPRISE HISTORIAN

OPC CORE

OPC SERVERS
- 3RD PARTY OPC SERVER
- STATUS MODBUS OPC SERVER
- HART PROTOCOL OPC SERVER

- DEVICENET
- PROFIBUS
- FIELDBUS FOUNDATION

- DM3000
- DM3000

FIELD MOUNTED HART DEVICES

OPC

Managed by the OPC Foundation, OPC (Object linking and embedding for Process Control) is an industry standard created with the collaboration of a number of leading worldwide automation and hardware/software suppliers working in co-operation with Microsoft.

The goal of the standard is 'Plug-and-Play'. By using the standard OPC client-server model, any OPC-compliant device will quickly, easily and seamlessly connect to another and immediately work without the need for lengthy installation procedures. The user can then concentrate more on the chosen client software package (e.g. DCS, SCADA, HMI, Plant Scheduling) rather than the problems of system integration.

The application of the OPC standard interface makes possible inter-operability between automation/control applications, field systems/devices and business/office applications.

HARDWARE PLATFORM

The minimum hardware requirements to run OPC are:
- IBM compatible PC
- P100 processor or higher
- 64 MB RAM
- 200 MB free disk space
- Microsoft windows
- 95 (SR2)/ 98/ NT4/ 2000

M-SCADA

To complement the Medacs range of signal conditioners, Status are pleased to offer the M-Scada software package, available in two versions, Lite suitable for up to 50 tags* and Professional for up to 100. This scada package integrates the MEDACS*II* series with the DM3000 series panel indicators and provides a very cost effective way of constructing a powerful control and monitoring system.
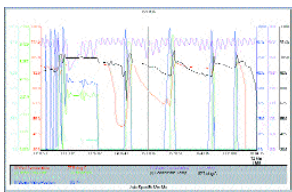
TRENDING

DISPLAY BUILDER
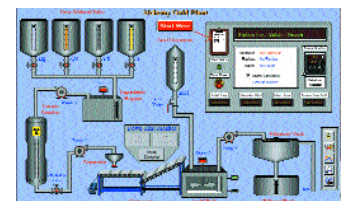
Lite	Professional	Display builder for Animated Mimics
		Historic and real time trending
		Current Alarm Status
		Alarm Banner
		Historic Alarm Reports
		System Security
		Recipe Handling
		On-line plant maintenance
		Sequence Control Language (SLANG)

The system is easily up-gradeable to a fully functional system with virtually unlimited I/O potential that can accept instruments from a wide range of third party manufacturers.

* A tag is an input, output or derived variable

SELF DOCUMENTATION

Thanks to the digital nature of MEDACS transmitters, self-documentation (not feasible with earlier analogue transmitters) becomes possible. In addition to the standard configuration data stored within the transmitters, are data related to the instrument itself such as Manufacturer, Part No., Serial No., Software revision No., Date (which can be used to advise when re-calibration is required), and Sensor Serial No. A 32 character message facility enables additional information, such as the name of the engineer who last serviced the instrument, to be recorded within the instrument itself.

By using the appropriate software tools, a complete device history can be maintained automatically thus ensuring cost savings and reduced down-time due to better programmed maintenance.

STATUS INSTRUMENTS

# DIN RAIL SIGNAL CONDITIONERS, WITH TFML...

MECHANICAL DETAILS (All dimensions in mm)
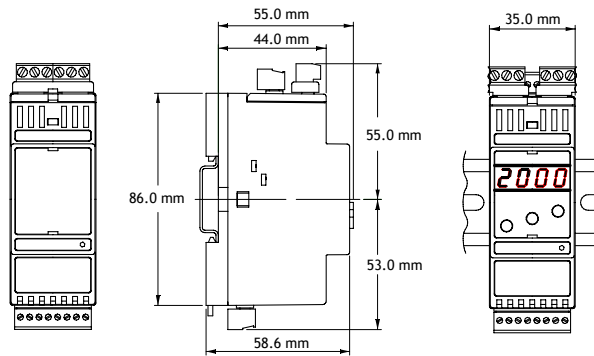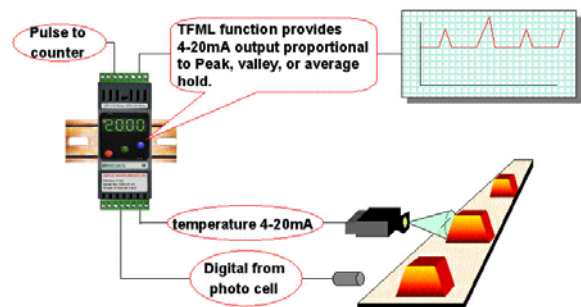

APPLICATIONS

TWIN FLOW METER CONTROL

Application: Accurate measurement of flow over a wide flow range can be problematical due to the turndown of the flow meter providing inaccurate measurement at extremes of span. A two channel MEDACS can take the inputs from two correctly sized flow meters, and by using a TFML function can select the most appropriate instrument for the conditions, signalling a valve to divert flow to the selected instrument. A continuous (4 to 20) mA output proportional to flow is maintained by the MEDACS.
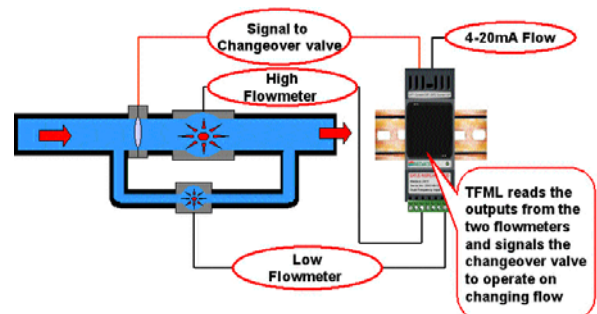

TEMPERATURE/ PEAK VALLEY HOLD

Application: Monitoring of temperature may require only peak, valley or average temperature to be recorded. A MEDACS can combine the inputs from an Infra Red Temperature Monitor and a photocell or proximity switch to take readings from a continuous process, taking readings only when signalled to do so by the switch. A (4 to 20) mA output proportional to temperature and a relay closure can be provided to count readings, if necessary within certain parameters, i.e. only count rejects etc

BUILDING MANAGEMENT

Application: *In this application in an art gallery, 8 MEDACS units take temperature and humidity inputs from each of the separate gallery areas. Two on board relays on each unit are configured to provide outputs to control air handling units as required. To provide overall visibility, a control room mounted PC displays the MEDACS software package, MSCADA ,which provides all relevant information for display and recording.*
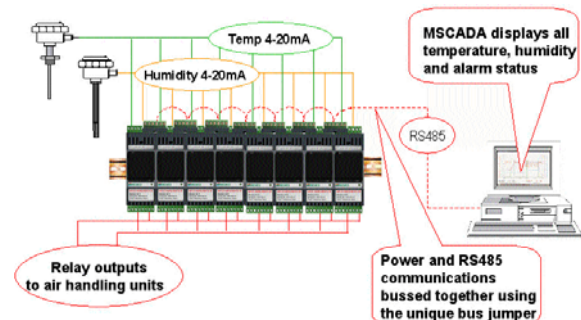
For more applications, please visit the 'Application Section' at: www.status.co.uk/medacs.html

STATUS
INSTRUMENTS

MEDACS AVAILABILITY TABLE

Part Number	Input	9 V Loop Power Input	9 V Loop Power Output	Channels	O/P 1	O/P 2	Display
MED2100	U	✓	x	Single	x	x	✓
MED2122	U	✓	x	Single	C/O relay	C/O relay	✓
MED2113	U	✓	✓	Single	Current O/P	Twin N/C	✓
MED2133	U	✓	x	Single	Twin N/C	Twin N/C	✓
MED2200	U	✓	x	Dual	x	x	x
MED2211	U	✓2	x	Dual	Current O/P	Current O/P	x
MED2213	U	✓2	x	Dual	Current O/P	Twin N/C	x
MED2222	U	✓2	x	Dual	C/O relay	C/O relay	x
MED2233	U	✓2	x	Dual	Twin N/C	Twin N/C	x
MED2300	F	x	x	Single	x	x	✓
MED2322	F	x	x	Single	C/O relay	C/O relay	✓
MED2313	F	x	✓	Single	Current O/P	Twin N/C	✓
MED2333	F	x	x	Single	Twin N/C	Twin N/C	✓
MED2400	F	x	x	Dual	x	x	x
MED2411	F	x	x	Dual	Current O/P	Current O/P	x
MED2413	F	x	x	Dual	Current O/P	Twin N/C	x
MED2422	F	x	x	Dual	C/O relay	C/O relay	x
MED2433	F	x	x	Dual	Twin N/C	Twin N/C	x

KEY:

U	=	Universal Temperature and Process
F	=	Frequency
Twin N/C	=	Two independent relays, closed in alarm and at power off

NOTE: Not all possible combinations are available as shown in the table below

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ORDER CODES

MEDACS			2			

SERIES

INPUTS

1 x Universal (With Display, Keys & 2 discrete inputs)	1
2 x Universal	2
1 x Frequency (With Display, Keys & 2 discrete inputs)	3
2 x Frequency	4

OUTPUTS 1

	0
(4 to 20) mA Re-transmission	1
C/O Relay	2
2 x N/C Relay	3

OUTPUTS 2

	0
(4 to 20) mA re-transmission	1
C/O Relay	2
2 x N/C Relay	3
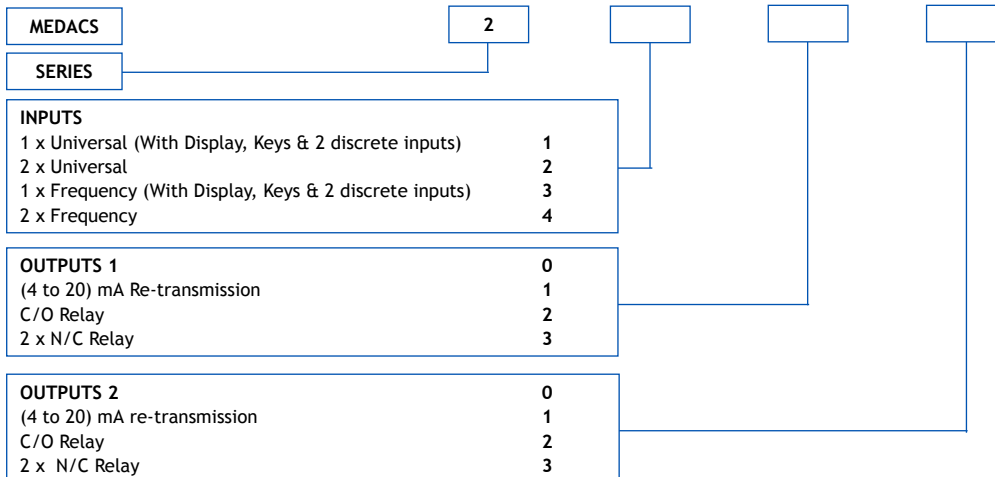
The following software packages are available from Status Instruments Ltd which will run on Windows 95, 98, 2000 or NT

M-CONFIG	Medacs configuration tool and engineers toolbox. This package is available as a free download from the website
M -OPC*1	Full functionality OPC server
M -SCADA -LITE*2	Scada package providing full animated display facilities and alarm monitoring with data logging and real time/ historical trending for up to 50 data points working with Status products only. Supplied with Medacs drivers.
M-SCADA - PROFESSIONAL*2	As M-Scada-Lite for up to 100 points with additional recipe handling, batch data facilities, on line plant maintenance and report generator. Supplied with Medacs drivers

A variety of waterproof, wall mounted enclosures are available for the Medacs units. Please contact the sales office for more information.

*1   The OPC server can be used with a host of other proprietary OPC compliant Scada packages.
*2   Both packages can be upgraded to a complete and fully functional Scada system accommodating many thousands of data points and compatible with all major instrumentation manufacturers and suppliers.