# DIN RAIL SIGNAL CONDITIONERS, WITH TFML.

## MEDACS

- UNIVERSAL OR FREQUENCY INPUT
- SINGLE CHANNEL OR DUAL CHANNEL
- DISPLAY OPTIONS
- GALVANIC ISOLATION
- UNIQUE POWER / COMMS RAIL SYSTEM
- OPTIONAL MATHS FUNCTIONS
- RS485 COMMS OR PUSH BUTTON SET UP
- ETHERNET COMPATIBLE


## 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. They accept all common signals and have a choice of output options including an isolated (0 or 4 to 20) mA re-transmission signal, change over 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 MEDACS to be integrated into a complete process control system. Unit wiring is simplified and speeded up by using the integral 'power / comms rail' system provided with each unit which removes the need for complicated and expensive back plane wiring.

The functionality is further enhanced by the optional inclusion of our unique Transfer Function Module Library (TFML) which enables complex maths functions between input and output 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 we can generate customversions to match your specific application and multiple devices can be grouped together to provide solutions for complex applications requiring more variables.

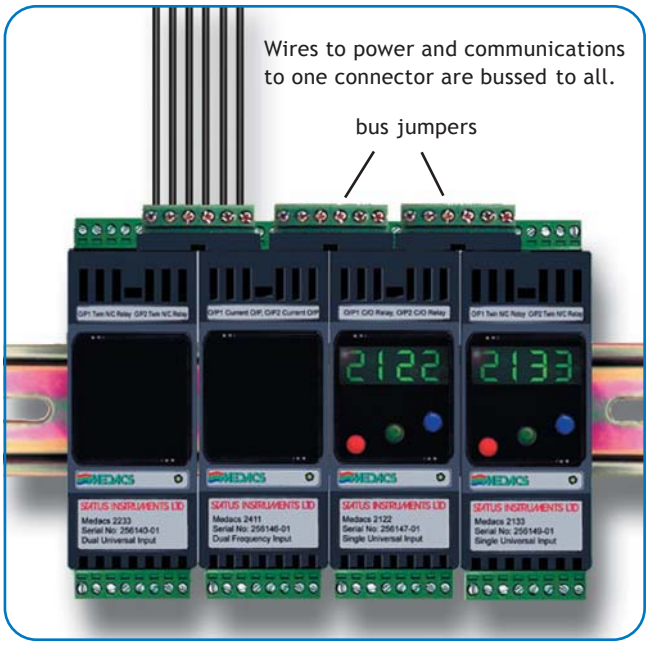
## TRANSFER FUNCTION MODULE LIBRARY (TFML)

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 TFML's are listed below and are available from our web site. They are simply downloaded into the MEDACS unit.

**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




STATUS INSTRUMENTS

# DIN RAIL SIGNAL CONDITIONERS, WITH TFML.

## 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 to5) |
| | Slidewire* |

### CURRENT INPUT

| | |
|---|---|
| Base Accuracy | 0.05%FS ±0.05% of reading |
| Thermal Drift | 0.02%/°C |
| Input Impedance | 20 W |
| Linearisation | Linear, Square root, Power $^{3}/_{2}$, Power $^{5}/_{2}$, Custom |

Two isolated and regulated 19V power supplies are available to power the current loops, and are capable of sourcing 25mA 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 W /°C |
| | Span | 0.01%/°C |
| Excitation Current | 1 mA | |
| Lead Resistance Effect | 0.002 °C/W | |
| Max. Lead Resistance | 50 W /leg | |

### THERMOCOUPLE

| TYPE | RANGE (°C) |
|---|---|
| K | -200 to 1370 |
| J | -200 to 1200 |
| T | -210 to 400 |
| R*◊ | -10 to 1760 |
| S*◊ | -10 to 1760 |
| E | -200 to 1000 |
| L | -100 to 600 |
| N | -180 to 1300 |
| B*≈ | -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 m /°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 MW |
| Linearisation | Linear, Square root, Power$^{3}/_{2}$, Power $^{5}/_{2}$, Custom |
| *Slidewire | 3 wire Potentiometer inputs can be accommodated between 50 W & 10 KW |

### 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.

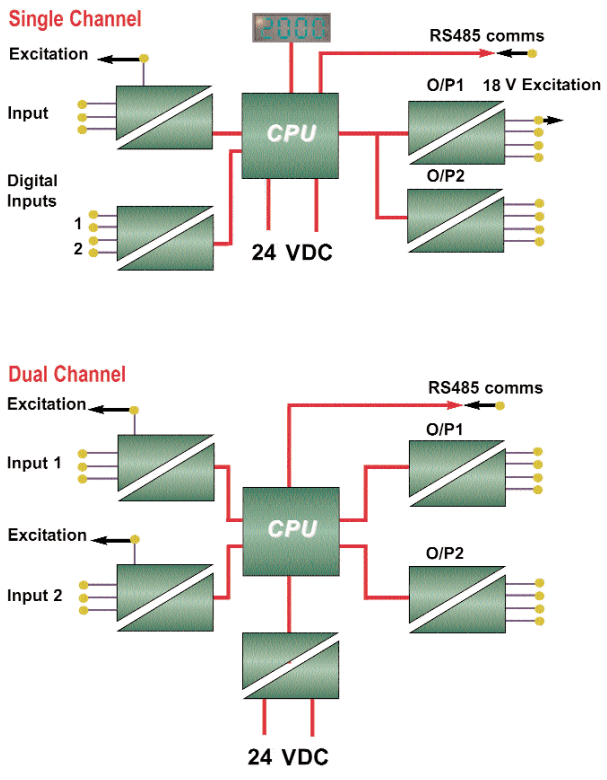
| | |
|---|---|
| Input Types | Namur, low Voltage (>10 mV), TTL, Open Collector, PFC |
| Frequency range | 0.1Hz to 20kHz. |
| Accuracy | 0.003% FS |

### 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 on whether they are fitted on the single or dual channel transmitter.

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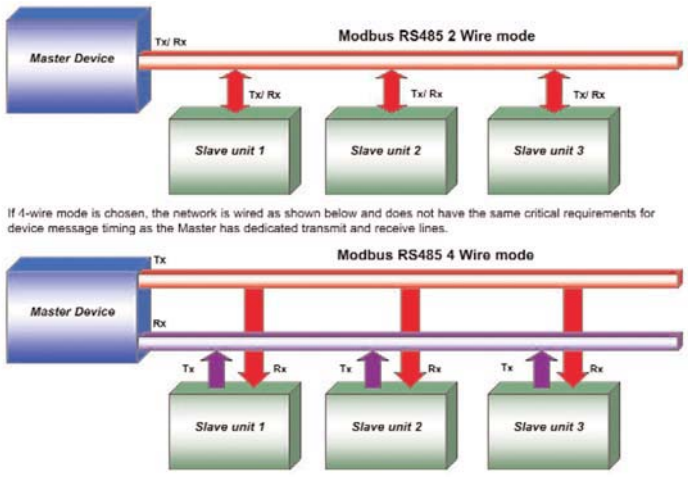


## CURRENT RE-TRANSMISSION OUTPUTS

| | |
|---|---|
| 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 m A/°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*≈ | Programmable | |
| Start-up Delay | Programmable | |
| | **AC** | **DC** |
| Max. Switching Voltage | 48V RMS | 48V |
| Max. Current | 1A @ 48 V | 1 A @ 30V |
| Max. Power | 60VA | 30W |
| Contact Resistance | < 100 MW | |
| Operate Time | < 5ms | |
| 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.

STATUS INSTRUMENTS

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## MEDACS AVAILABILITY TABLE

| Part Number | Input | 9 V Loop Power Input | Output | Channels | O/P 1 | O/P 2 | Display |
|---|---|---|---|---|---|---|---|
| MED2100 | U | ü | x | Single | x | x | ü |
| MED2122 | U | ü | x | Single | C/O relay | C/O relay | ü |
| MED2113 | U | ü | ü | Single | Current O/P | Twin N/C | ü |
| MED2133 | U | ü | x | Single | Twin N/C | Twin N/C | ü |
| MED2200 | U | ü | x | Dual | x | x | x |
| MED2211 | U | ü2 | x | Dual | Current O/P | Current O/P | x |
| MED2213 | U | ü2 | x | Dual | Current O/P | Twin N/C | x |
| MED2222 | U | ü2 | x | Dual | C/O relay | C/O relay | x |
| MED2233 | U | ü2 | x | Dual | Twin N/C | Twin N/C | x |
| MED2300 | F | x | x | Single | x | x | ü |
| MED2322 | F | x | x | Single | C/O relay | C/O relay | ü |
| MED2313 | F | x | ü | Single | Current O/P | Twin N/C | ü |
| MED2333 | F | x | x | Single | Twin N/C | Twin N/C | ü |
| 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*

## 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.*

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