

1 Introduction

This document describes the use and application of a TFML module suitable for downloading into a Medacs module. It should be used in conjunction with the Medacs installation guide of the full Medacs technical handbook.

2 Connections

See Medacs installation guide

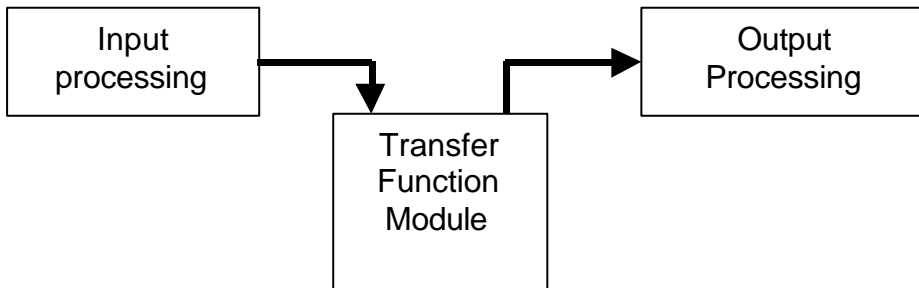
3 TFML Overview

In addition to the normal range of features and functions incorporated within the Medacs range of instruments, there is the facility to program user software to customise the functionality.

The normal operation of a standard transmitter is as indicated below, with an electrical input processed to linearise and condition the sensor value, then this value is used to create an output. The relationship between processes input and output is referred to as the transfer function. In this case it is a simple linear relationship but more complex relationships are often required.



If the relationship between input to output can be broken, a programmable module may then be inserted to define a new transfer function as shown below.



A transfer function is defined using a high level programming language that can be used to program the functionality. These program modules can either be obtained pre-written for standard features such as PID control, or written directly for specific requirements. The pre-written functions are available from a library of modules available from the TFML web page, hence the name Transfer function Module Library.

These modules are available in text format written in a programming language called 'FORTH'. A FORTH compiler is embedded within the Medacs module and the program is compiled as it is downloaded.

4 Procedure For Loading a TFML Module

TFML modules are available either from our web site or, in the case of a custom application, on floppy disk. The module consists of two parts, a .tfm file which is the text based program and this .pdf instruction sheet.

The .tfm file should be either downloaded from the web or copied from the supplied floppy disk to an appropriate directory on the PC. To load the file to the Medacs unit requires M-Config. This is the Status' MEDACS configuration software, which uses Modbus communications to configure MEDACS units. It is available as a free download from our web site.

The TFML module can take over control of either output slot and/or of the display. It is quite common to have one output used in its standard (default) mode whilst another is controlled by TFML. For each TFML module, the user should be sure how each output is controlled.

To load a TFML, start M-Config and upload the device configuration. When the device configuration has been uploaded, select the TFML tab and then 'Installer'. Click on 'Load' and then select the appropriate TFML module (*.tfm) and then click on open.

The module will then be downloaded to the device. The TFML download requires the MEDACS to interpret and compile the TFML source code and this may take a few seconds. A progress bar shows the progress of the download and a TFML Block Usage bar shows how much of the available TFML memory is used. After the download is complete a message appears prompting the user to remove and restore power to the device. This is required to ensure that all parameters are reset and the unit may not work correctly if this is not done.

5 Configuring TFML

Users should refer to the Medacs Installation guide for details of how to set up the standard features of the unit either from M-Config or, in the case of single channel units, from the three front panel keys.

TFML has four registers that are available for TFML variables that need to be set by the operator. These registers are accessible either via M-Config (TFML...User...Variables 1,2,3,4) or from the front panel keys on single channel units (input...out1...out2...sys...TFNL).

These registers are named TFN1,2,3 and 4 but it is possible to enter a 4 character string to ensure that something more meaningful appears on the seven segment display if the operator access is required. Note that the 4 character strings can not be changed via the three front panel keys. The registers are also accessible via Modbus.

As each TFML can be very different from the last, these registers can have vastly different functions depending upon the application and the user should

be familiar with the function of these registers, details of which are contained later in this document. Failure to set up these registers correctly will result in the incorrect operation of the unit.

6 Troubleshooting

Medacs unit won't communicate:

- Check correct Baud rate is selected for both device and PC.
- Check the correct COM port has been selected
- If the communications settings are unknown, all configuration data can be reset by pressing the reset button for 2 seconds while the unit is being powered up. The default settings are: 19k2 baud, 4-wire RS485, device address 0. The reset button is located the underside of MEDACS units and is only accessible by inserting a screwdriver through the case's venting window slots. Note that this will reset almost ALL configuration settings to the factory defaults and the unit will need to be completely re-programmed.
- Check connections
- Check power supply available to units and RS232/485 convertor (if used)
- Check that device addresses are set correctly.
- Has the multi-drop comms upgrade been purchased and the Network Enable Passcode (NEP) correctly entered.
- Check that the correct communications mode has been selected (Single/Multiple Device mode). Without the correct NEP, only single device mode is applicable.

If the TFML module downloads but does not work as expected check the following:

- Did you power off and on to initialise the TFML module?
- Check that the appropriate TFML module has been loaded, a reference number is contained on the TFML installer screen of M-Config.
- Check that the TFML module has been downloaded to the correct Medacs device type.
- Check that the TFML module has been downloaded to the correct Medacs device address.
- Check that other (non TFML) parameters have been configured correctly (Input, Non TFML controlled outputs etc.)
- Check that the 4 TFML registers have been correctly set up.

If all of the above are OK then please contact our technical support line and quote the following information:

- Medacs type and serial numbers.
- Where and when you purchased them.
- TFML reference number.
- How the unit's input(s) are configured.
- What you have set the 4 TFML registers to be.
- What you expected to happen.
- What is actually happening!

7 Description

TFML Module User Guide

Sensor Validation (TFML ID = 02011111)

Designed for: **MEDACS 2213**

Operation:

O/P 1 is proportional to average of two sensor inputs as long as both sensors are in bounds. If either sensor goes out of bounds, the output reverts to the "good" sensor and the second output changes as defined below. The retransmitted current (4-20mA) is scaled to Sensor 1 high/low.

State		Action		
Sensor 1	Sensor 2	Output1	Relay 2A	Relay 2B
in range	in range	retransmitted average	open	open
in range	out of range	sensor 1 retransmitted	open	closed
out of range	in range	sensor 2 retransmitted	closed	open
out of range	out of range	21.5mA	closed	closed

TFML register Function

TFN1	Sensor 1 low
TFN2	Sensor 1 high
TFN3	Sensor 2 low
TFN4	Sensor 2 high