- 12 Configurable Inputs and Outputs

- Pre-configured for Stop Start control

- Licence Free band Radio Link

- Programmable Control Options

- SD Card Logging – Optional

- Touch Screen (operator Interface terminal) - Optional

- Low power operation

- 2 Analogue Channels Configurable

FEATURES

- **Low Power operation**
- **12 Inputs and/or Outputs (Analog or Digital)**
- **9 - 30V dc powered.**
- **SD Memory Card Slot for off-line data logging.**
- **On-board temperature sensor and voltage monitor**

- **Integral Real-Time Clock with Battery Backup**
- **Programmable for a wide range of applications.**
- **Wide operating temperature range**
- **Compact size for tight spaces**
- **Convenient DIN Rail mounting**

OVERVIEW

The TELETERM M2 series is a state-of-the-art RTU range designed to expand the possibilities of remote monitoring and control by providing a cost effective platform with a wide range of features.

Communications options include licence-free Radio in a number frequency bands i.e. Range of up to 4km on 2.4GHz operating band, 20km on 868MHz operating band.

The TELETERM M2 comes with 12 universal I/O that can be configured for analogue or digital input or output according to your needs. The basic Stop Start configured system is preconfigured with 2 Potential Free contact inputs at the remote control site and Two 10Amp relay contacts at the Pump end. Two Potential Free contact inputs on the pump end provide feedback to the remote control end.

The on board RS232/485 port can be used to acquire data from other third party devices using either the Modbus protocol, or by downloading a custom software protocol "plug-in". This feature allows a wide variety of third party devices to be supported. E.g. Monitoring Pump Electrical Parameters from an Electricity meter.

The low power consumption of the Teleterm M2 makes it suitable for use in solar powered and battery powered applications. E.g. Reservoir level control to Remote Pump

Typical applications for the M2 include:

- Environmental Monitoring
- Remote Site Monitoring
- Utilities monitoring
- Pump Stop and Start Control
- Reservoir Pump Integrated Control
- Last Mile Communications Interface
- Message Board Wireless Connection from Plant
- In Plant Cable Saving

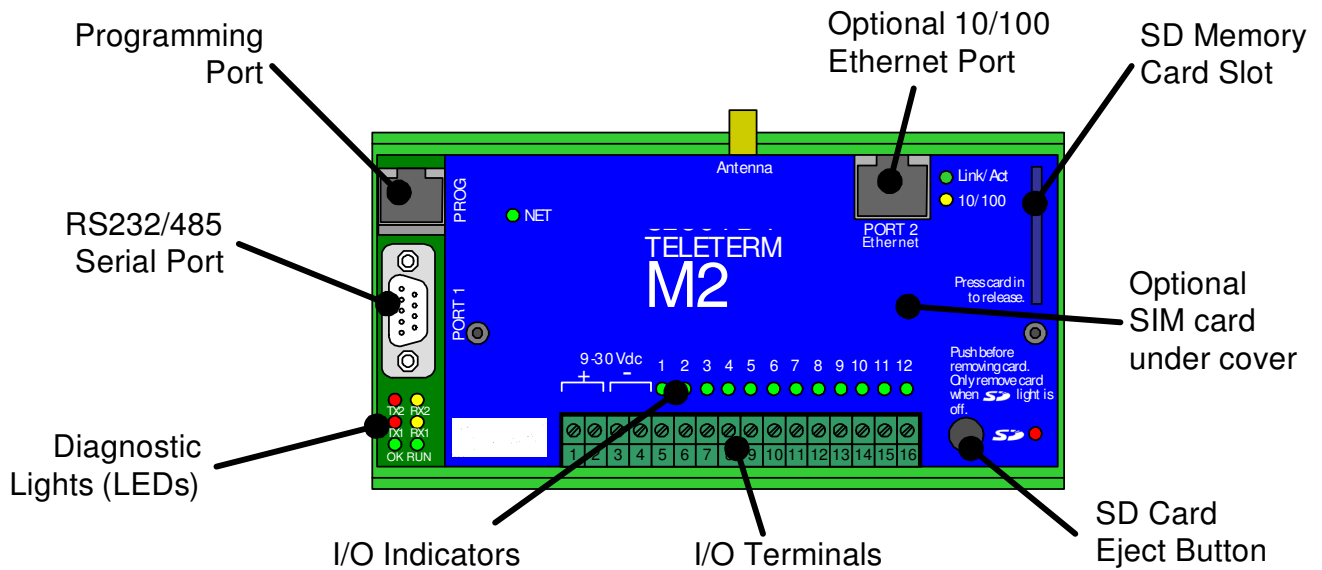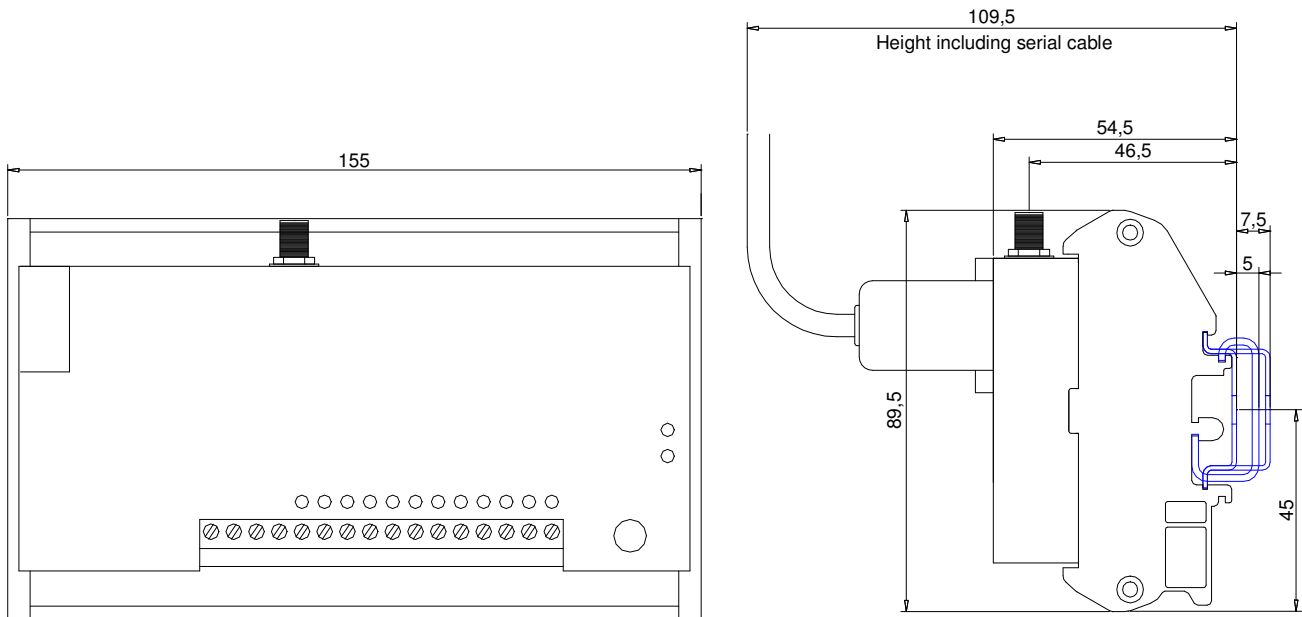Stay in touch – Take control with the Teleterm M2 Series from Omniflex.

General Layout

Programming Port

Optional 10/100 Ethernet Port

SD Memory Card Slot

RS232/485 Serial Port

Antenna

● Link/Act
● 10/100

PROG

● NET

TELETERM
M2

PORT 2
Ethernet

Press card in
to release.

PORT 1

Optional SIM card under cover

9-30 Vdc
+ −

1 2 3 4 5 6 7 8 9 10 11 12

Push before
removing card.
Only remove card
when SD light is
off.

TX2 RX2
TX1 RX1
OK RUN

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

SD ●

Diagnostic Lights (LEDs)

I/O Indicators

I/O Terminals

SD Card Eject Button

Mechanical Dimensions

155

109,5
Height including serial cable

54,5
46,5

7,5
5

89,5

45

Communication Functions by Model

Product Name	Order Code	Notes	12 I/O	RS232/ RS485 Port	2.4GHz 63mW Radio Port	920MHz 100mW Radio Port	868MHz 315mW Radio Port	920MHz 1W Radio Port
M2R1	C2360B-31	1,2	✓	✓	✓			
M2R2	C2360B-32	1,3	✓	✓		✓		
M2R3	C2360B-33	1,4	✓	✓			✓	
M2R4	C2360B-34	1,4	✓	✓				✓

NOTES:

1. *The M2R version is available in a number radio band options to comply with different country regulations. Please ensure that the correct unit is specified for your application.*

2. *2.4GHz Band is suitable for use all countries.*

3. *920MHz Band is suitable for use in USA, Australia and New Zealand.*

4. *868MHz Band is suitable for use in Europe, Europe aligned Countries and South Africa.*

Input/Output Configurable Options

The M2R is equipped with 12 versatile input/output points (I/O points or IOP's). Each I/O point can be individually configured from the options given in the following table:

I/O Point	Terminal No.	Digital Input	Analogue Input	Digital Output	Analogue Output
1	5	Yes	0-30Vdc	Yes	-
2	6	Yes	0-30Vdc	Yes	-
3	7	Yes	0-5Vdc	Yes	-
4	8	Yes	0-5Vdc	Yes	-
5	9	Yes	0-5Vdc	Yes	-
6	10	Yes	0-5Vdc	Yes	-
7	11	Yes	0-5Vdc	Yes	-
8	12	Yes	0-5Vdc	Yes	-
9	13	Yes	0-5Vdc	Yes	-
10	14	Yes	0-5Vdc	Yes	-
11	15	Yes	0-30Vdc	-	0/4-20mA
12	16	Yes	0-30Vdc	-	0/4-20mA

Note 1: See the "Specifications" section of this document for detailed specifications of each I/O point option.
Note 2: All 0-30V analogue inputs have increased resolution over the range 0-6V (equivalent to the 0-5V inputs).
Note 3: All Digital Inputs can be configured as Pulse Counters or Hours Counter.
Note 4: All Digital Outputs can be configured as Pulse outputs (normally ON or normally OFF).

Configuration for Basic Stop Start Control Application in wall mount panel. *Other Configurations on request*

| Remote Control Side			Pump Control Side		
I/O Point	Terminal No.	I/O Type	I/O Point	Terminal No.	I/O Type
1	5	Control Input Ext Switch Pot Free	1	5	Control Output Via 10A Relay Contact
2	6	Control Input Ext Switch Pot Free	2	6	Control Output Via 10A Relay Contact -
3	7	Feedback Output Lamp	3	7	Feedback Contact Potential Free Contact Reqd
4	8	Feedback Output Lamp	4	8	Feedback Contact Potential Free Contact Reqd
5	9	Feedback Output Via 10A Relay Contact	5	9	Feedback Contact Potential Free Contact Reqd
6	10	Feedback Output Via 10A Relay Contact	6	10	Feedback Contact Potential Free Contact Reqd
7	11	Spare Input	7	11	Spare Output Open Collector
8	12	Spare Input	8	12	Spare Output Open Collector
9	13	Spare Output Open Collector	9	13	Spare Input
10	14	Comms Link Ok Lamp	10	14	Comms Link Ok Lamp
11	15	Optional Analogue Input 0-5Vdc	11	15	Optional Analogue Output 0/4-20mA
12	16	Optional Analogue Output 0/4-20mA	12	16	Optional Analogue Input 0-5Vdc
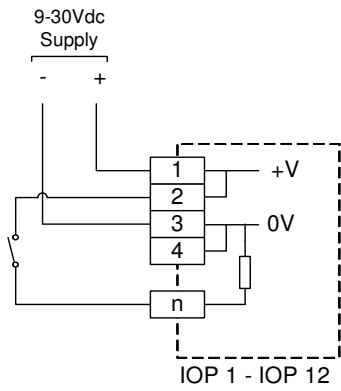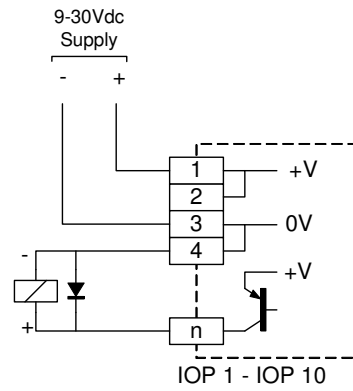
DIGITAL INPUTS

DIGITAL OUTPUTS
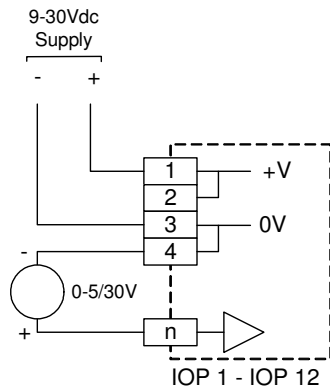
ANALOGUE INPUTS
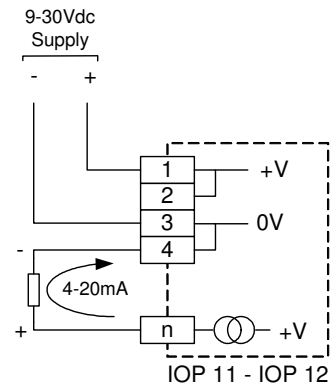
ANALOGUE OUTPUTS

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SPECIFICATIONS COMMON TO ALL MODELS

Input/Outputs

All M2 RTU's have 12 Input/Output Points (IOP configurable in software as analogue or digital, inputs or outputs.

(See the table above for a matrix of available functions on each I/O Point.)

As a Digital Input (IO Points 1 to 12)

Type	Current Sink (Switch to +V to operate)
Input Impedance	5 kohms nominal.
Input OFF Condition	Input < 2Vdc
Input ON Condition	Input > 3Vdc
Functions	Software selectable as: ON/OFF Input Counter Input (counts rising edge pulses) Hours Input (counts hours while input is on to resolution of 0.01 hours).

As a Digital Output (IO Points 1 to 10)

Type	Voltage Source (Solid State Switch to +V)
ON State Rated Current	< 100mA continuous maximum per output < 200mA peak (<10ms) max, per output < 500mA total for all outputs simultaneously
ON State Volt Drop	< 3V at maximum rated load
OFF State Rated Leakage Current	< 0.1mA at maximum supply voltage
Functions	Software selectable as: ON/OFF ON Pulse (configurable 10ms – 300s) OFF Pulse (configurable 10ms = 300s)

As an Analogue Input (I/O Points 1,2, 11, 12)

Type	Voltage Input referenced to 0V supply.
Range	0-30Vdc (software configurable to smaller ranges such as 1-5Volts)
Accuracy	< 0.15% of reading +6mV from 0 to 5.5V < 0.15% of reading +30mV from 5.5 to 30V
Resolution	6mV from 0 to 5.5 Volts nominal (10 bits) 33mV from 5.5 to 30Volts nominal (10 bits)

As an Analogue Input (I/O Points 3 to 10)

Type	Voltage Input referenced to 0V supply.
Range	0-5.5Vdc (software configurable to smaller ranges such as 1-5Volts)
Accuracy	< 0.25% of reading +6mV
Resolution	6mV nominal (10 bits)

As an Analogue Output (I/O Points 11 and 12)

Type	4-20mA Source into 0V connected load
Load	Calculate maximum load as follows: $R_{max} = (V_{supply} - 5V) \div .02$ ohms Examples: 11V Supply: R_{max} = 300 ohms 13.8V Supply: R_{max} = 440 ohms 22V Supply: R_{max} = 300 ohms 24V Supply: R_{max} = 950 ohms 27.6V Supply: R_{max} = 1130 ohms
Maximum Range	0 to 23 mA (software configurable to smaller ranges such as 4-20mA or 0-10mA)
Accuracy	< 0.25% of full scale

General Specifications

Power Requirements

Power Supply Voltage	9 – 30Vdc (ripple < 5%)
Average Current	80mA at 12Vdc 40mA at 24Vdc

IEC61131-3 Programming (Optional)

Six graphical Languages	SFC – Structured Flow Chart FC – Flow Chart FBD – Function Block LD – Ladder Diagram ST – Structured Text IL – Instruction List
Programming Environment	Windows PC based "Omniflex ISaGRAF Application Workbench"

Protocol Programming

Language	EventForth
Program Space	16kBytes Program memory 8kBytes User RAM memory

Environmental Conditions

Storage Temperature	-25°C – 85 °C (-13°F – 185°F)
Operating Temperature	-10°C – 60 °C (+14°F – 140°F)
M2G Radio compliance	-10°C – 50 °C (+14°F – 122°F)

Processor

Type	Dual Core 16 Bit Processor
Clock Speed	40MHz
Memory – Flash / RAM	512kB / 256kB

Real Time Clock

Resolution	10ms
Accuracy	1 min per month
Battery Life	> 1 year with power off > 5 years with power on.
Battery Type	3V Lithium Cell type CR2032

Compliance with Standards

Safety	EN 60950:1995
Emissions	EN 55011 EN50081-2:1994 Group I, Class A EN50082-2
Immunity – ESD	IEC 61000-4-2:1995, level 3
Immunity – RF Fields	IEC 61000-4-3:1995, level 3
Immunity – Fast Transients	IEC 61000-4-4:1995 2 kV – DC power port 1 kV – input/output lines

Weight

Packed/Unpacked	350gm/250gm approx.
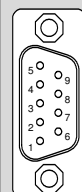
Front Panel Serial Port (available on all models)

Type	Asynchronous serial port
Protocols	Supports the following protocols as standard: • Conet/s • Modbus ASCII (Master or Slave) • Modbus RTU (Master or Slave). • Other protocols written in the EventForth programming language may be downloaded.
Baud Rate	300 – 38,400 baud.
Maximum cable length	15 meters (50ft) in RS232 mode 1200m (4000ft) in RS485 mode
Connection	9 pin sub-miniature DB9 (male).
RS232/422/485	Selected by the wiring to the DB9 connector

Pin	Communication Standard	
	RS232	RS485
1	Do not connect	Rx Data + (In)
2	Rx Data (In)	Rx Data – (In)
3	Tx Data (Out)	Do not connect
4	Do not connect	Tx Data+ (Out)
5	Ground	Ground
6	Do not connect	Vcc
7	RTS (Out)	Do not connect
8	CTS (In)	Do not connect
9	Do not connect	Tx Data – (Out)

Plug-in Memory Card (available on all models)

Type	Standard SD Memory Card (24mm x 32mm x 1.4mm)
Storage Capacity	SD Memory Card dependent: Up to 2Gb supported
Card Format	PC Compatible FAT File Format

Data Format	Data writable by program to suit application. Any text based file format may be written such as CSV File Format compatible with Microsoft Excel etc.

Network Communications Specifications for the Teleterm M2R1(e)   Model C236xB-31 (2.4GHz 63mW)

Operating Band	ISM 2.4Ghz	RF Data Rate	250,000 bits per second
Special Radio Licence Requirements	None. (operates in licence-free ISM band)	Serial Data Rate	9,600 bits per second
Transmit Power	63mW (+18dBm)	Indoor/Urban Range Outdoor (LOS)	90m 1 km
Receiver Sensitivity	-100dBm typical	Antenna	RPSMA Connector for external antenna
Modulation	DSSS FSK	Approvals	Approved for use internationally

Network Communications Specifications for the Teleterm M2R2(e)   Module C236xB-32 (920MHz 100mW)

Operating Band	915-926 MHz	Throughput Data Rate	9600 bits per second
Special Radio Licence Requirements	None. (operates in licence-free ISM band)	Number of Channels	7 Frequency Hopping Sequences
Transmit Power	100mW (+20dBm)	Outdoor Range (Line of Sight)	Up to 1 km with dipole Up to 8 km with hi-gain antenna
Receiver Sensitivity	-110dBm typical	Antenna	RPSMA Connector for external antenna
Modulation	DSSS FSK	Approvals	Approved for use in USA and Australia

Network Communications Specifications for the Teleterm M2R(e)-3   Module C236xB-33 (868MHz 315mW)

Operating Band	SRD g3 Band (869.525 MHz)	Throughput Data Rate	2,400 bits per second 10% duty cycle
Special Radio Licence Requirements	None. (operates in licence-free ISM band)	Number of Channels	Single Channel
Transmit Power	315mW (+25dBm)	Outdoor Range (Line of Sight)	Up to 20 km with dipole Up to 40 km with hi-gain antenna
Receiver Sensitivity	-112dBm typical	Antenna	RPSMA Connector for external antenna
Modulation	FSK	Approvals	Approved for use in Europe and S.Africa

Network Communications Specifications for the Teleterm M2R(e)-4   Module C236xB-34 (920MHz 1W)

Operating Band	915-928 MHz	Throughput Data Rate	9,600 bits per second
Special Radio Licence Requirements	None. (operates in licence-free ISM band)	Number of Channels	10 Frequency Hopping Sequences
Transmit Power	Settable 1mW (0dBm) to 1W(+30dBm)	Outdoor Range (Line of Sight)	Up to 10 km with dipole Up to 30 km with hi-gain antenna
Receiver Sensitivity	-110dBm typical	Antenna	RPSMA Connector for external antenna
Modulation	FHSS FSK	Approvals	Approved for use in USA and Australia

Ordering Information

http://www.omniflex.com

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ORDER CODE	PRODUCT	DESCRIPTION
C2360B-32 – x	Teleterm M2R2	Teleterm M2R Programmable RTU equipped with integral 920MHz 100mW FHSS licence-free radio network port (USA, Australia, NZ only)
C2360B-33 – x	Teleterm M2R3	Teleterm M2R Programmable RTU equipped with integral 868MHz FHSS licence-free radio network port (UK, South Africa & European aligned countries)
C2360B-34 – x	Teleterm M2R4	Teleterm M2R Programmable RTU equipped with integral 900MHz 1W FHSS licence-free radio network port (USA, Australia, NZ only)
C2360B-41 – x	Teleterm M2S1	Teleterm M2S Programmable RTU equipped with second and third RS232/485 serial ports.

ACCESSORIES

M1833A	MX RS232/485 Serial Patch Cable	RS232/485 Female DB9 connector (M2 end) to loose ends. 2 metres.