



TELETERM M3 Series Programmable RTU's

Model C2363A -31/32/34 Teleterm M3 Radio RTU's.

DATASHEET



- 12 Configurable Inputs and Outputs
- 2.4 GHz, 868MHz and 900MHz radio port operating in license-free bands
- ISaGRAF IEC61131-3 Ready (order CC030A-URTT to activate)
- Internet Ready Comms
- SD Card Logging
- Low power operation
- 10/100 Ethernet

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**

OVERVIEW

The TELETERM M3R(e) is a state-of-the-art radio RTU designed to expand the possibilities of remote monitoring using point-to-point RF communications in license-free bands and providing a cost effective platform with a wide range of features.

The TELETERM M3R(e) comes with 12 universal I/O that can be configured for analogue or digital input or output according to your needs as well as a powerful radio modem.

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.

The low power consumption of the Teleterm M3R(e) makes it suitable for use in solar powered and battery powered applications.

The Teleterm M3R(e) can also be programmed in the optional ISaGRAF, an industry standard programming environment for all five IEC61131-3 programming languages, providing the ability to do local control, and custom logic. Order CC030A-URTT to activate ISaGRAF.

- **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**

The Teleterm M3R(e) also incorporates an SD memory card slot to support local data logging.

Typical applications for the M3R(e) include:

- Energy Management and Remote Meter Reading.
- Monitoring of Ultra/Canberra Radiological Monitors
- Environmental Monitoring
- Remote Site Monitoring
- Utilities monitoring
- Pump Stop and Start Control
- Reservoir Pump Integrated Control
- Message Board Ethernet Connection from Plant

Stay in touch – Take control
with the Teleterm M3 Series
from Omnicflex.

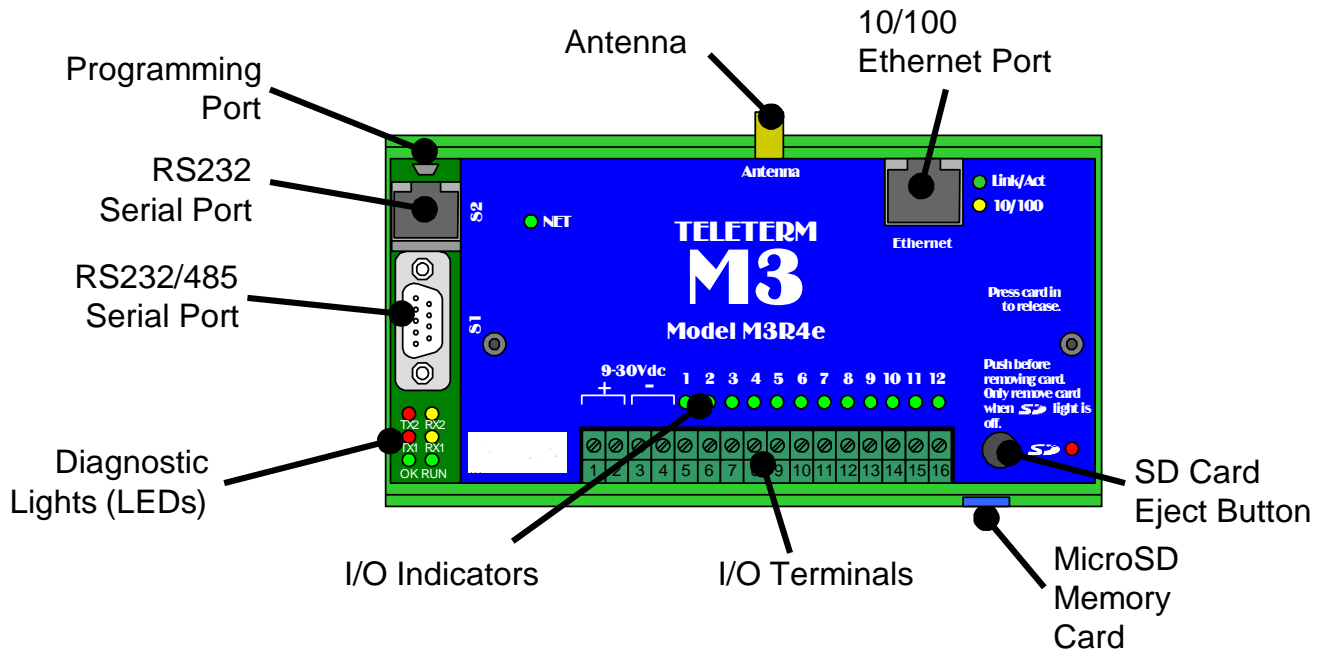




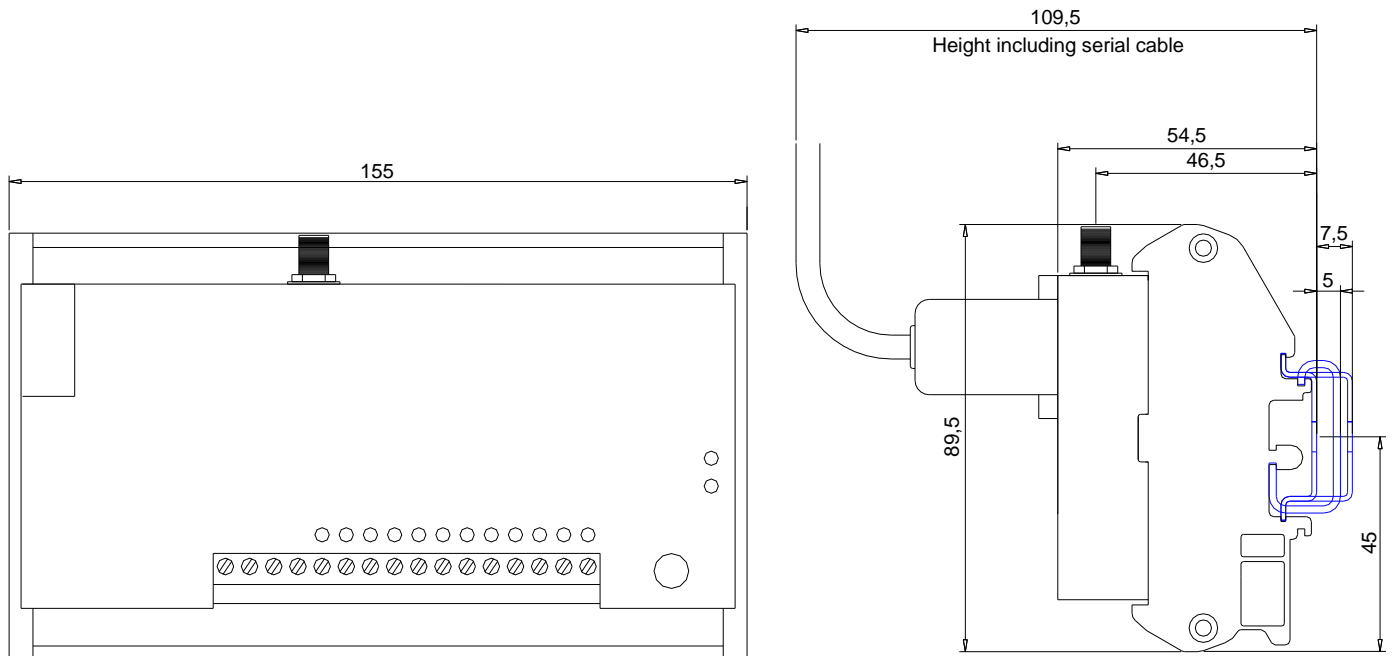
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General Layout



Mechanical Dimensions





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Communication Functions by Model

Product Name	Order Code	Notes	12 I/O	10/100 Ethernet	RS232 Port	RS232/RS485 Port	2.4GHz 63mW Radio Port	868MHz 315mW Radio Port	920MHz 1W Radio Port
M3R1e	C2363A-31	1,2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
M3R2	C2363A-32	1,3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
M3R4e	C2363A-34	1,4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>

NOTES:

1. *The M3R(e) versions are 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 all countries; short range only*
3. *868MHz Band is suitable for use in Europe, and South Africa*
4. *920MHz Band is suitable for use in USA, Australia and New Zealand.*



TELETERM M3 Series Programmable RTU's

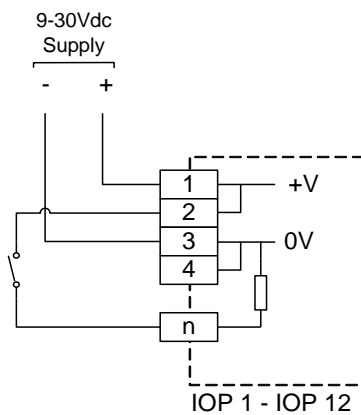
Model C2363A -31/32/34 Teleterm M3 Radio RTU's.

Input/Output Configurable Options

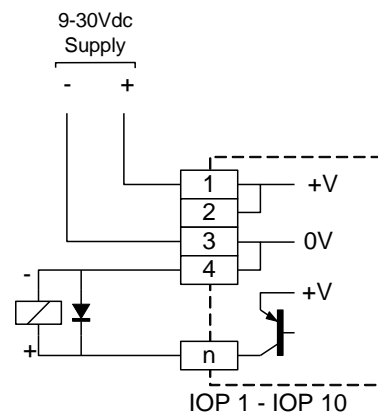
The M3 is equipped with 12 versatile input/output points (I/O points or IOP's). Each I/O point can be individually configured from the options given in the following table:

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

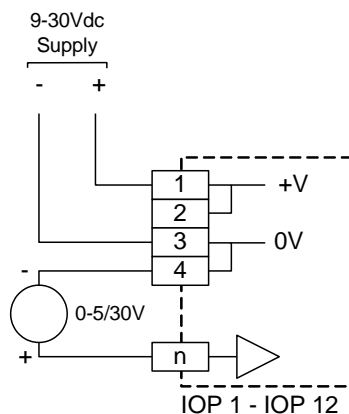
- Note 1:** See the "Specifications" section of this document for detailed specifications of each I/O point option.
Note 2: All 0-30V analogue inputs have increased resolution over the range 0-6V (equivalent to the 0-5V inputs).
Note 3: All Digital Inputs can be configured as Pulse Counters or Hours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



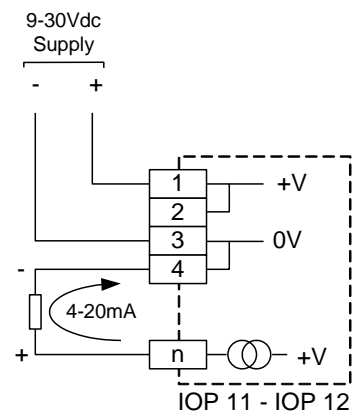
DIGITAL INPUTS



DIGITAL OUTPUTS



ANALOGUE INPUTS



ANALOGUE OUTPUTS



TELETERM M3 Series Programmable RTU's

Model C2363A -31/32/34 Teleterm M3 Radio RTU's.

SPECIFICATIONS COMMON TO ALL MODELS

Input/Outputs

All M3 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	< 100mA continuous maximum per output
Rated Current	< 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.
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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: $R_{max} = (V_{supply} - 5V) \div .02 \text{ Ohms}$ Examples: 11V Supply: $R_{max} = 300 \text{ Ohms}$ 13.8V Supply: $R_{max} = 440 \text{ Ohms}$ 22V Supply: $R_{max} = 300 \text{ Ohms}$ 24V Supply: $R_{max} = 950 \text{ Ohms}$ 27.6V Supply: $R_{max} = 1130 \text{ Ohms}$
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”

Environmental Conditions

Storage Temperature	-25°C – 85 °C (-13°F – 185°F)
Operating Temperature	-10°C – 60 °C (+14°F – 140°F)
M3G Radio compliance	-10°C – 50 °C (+14°F – 122°F)

Weight

Packed/Unpacked	350gm/250gm approx.
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Processor

Type	Dual Core 16 Bit Processor
Clock Speed	72MHz
Memory – Flash / RAM	1MB / 512kB

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
Emissions	EN 55011, Group I, Class A
Immunity – ESD	IEC 61000-4-2:2001, level 3
Immunity – RF Fields	IEC 61000-4-3:2003, level 3
Immunity – Fast Transients	IEC 61000-4-4:2004 2 kV – DC power port 1 kV – input/output lines





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Front Panel Serial Port (available on all models)

Type	Asynchronous serial port
Protocols	Supports the following protocols as standard: <ul style="list-style-type: none"> • Conet/s • Modbus ASCII (Master or Slave) • Modbus RTU (Master or Slave).
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)

* Tx+ and Rx+ (pins 1 and 4) need to be connected together as do Tx- and Rx (pins 2 and 9) when using RS485 2-wire

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.
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Ethernet Port (available on all models)

Network Port	
Type	10/100 UTP Ethernet
Specifications	
Network Protocol Support	UDP/IP and TCP/IP

Protocols	Modbus/TCP Class 0 Conet/e for remote programming and network routing.
IP Addressing	Fixed IP set during configuration.

Network Communications Specifications for the Teleterm M3R1e Model C2363A-31 (2.4GHz 63mW)

Operating Band	ISM 2.4GHz
Special Radio Licence Requirements	None. (operates in licence-free ISM band)
Transmit Power	63mW (+18dBm)
Receiver Sensitivity	-100dBm typical
Modulation	DSSS FSK
RF Data Rate	250 000 bits per second

Throughput Data Rate	9600 bits per second 10% duty cycle
Number of Channels	12 Direct Sequence Channels
Outdoor Range (Line of Sight)	90m 1.6km
Antenna	RPSMA Connector for external antenna
Approvals	Approved for use internationally

Network Communications Specifications for the Teleterm M3R2 Model C2363A-32 (868MHz 500mW)

Operating Band	SRD g3 Band (869.525 MHz)
Special Radio Licence Requirements	None. (operates in licence-free ISM band)
Transmit Power	500mW (+27dBm)
Receiver Sensitivity	-109dBm typical
Modulation	FSK

Throughput Data Rate	1,200 to 19,200 bits per second 10% duty cycle LBT (Listen Before Talk)
Number of Channels	Three Channels
Outdoor Range (Line of Sight)	Up to 20 km with dipole Up to 40 km with hi-gain antenna
Antenna	RPSMA Connector for external antenna
Approvals	Approved for use in Europe and S.Africa

Network Communications Specifications for the Teleterm M3R4e Model C2363A-34 (920MHz 1W)

Operating Band	915-928 MHz
Special Radio Licence Requirements	None. (operates in licence-free ISM band)
Transmit Power	Settable 1mW (0dBm) to 1W(+30dBm)
Receiver Sensitivity	-110dBm typical
Modulation	FHSS FSK

Throughput Data Rate	9,600 bits per second
Number of Channels	10 Frequency Hopping Sequences
Outdoor Range (Line of Sight)	Up to 10 km with dipole Up to 30 km with hi-gain antenna
Antenna	RPSMA Connector for external antenna
Approvals	Approved for use in USA and Australia





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Ordering Information

ORDER CODE	PRODUCT	DESCRIPTION
C2363A-31 *	Teleterm M3R1e	Teleterm M3R1e Programmable RTU equipped with 10/100 Ethernet Port and integral 2.4GHz 63mW licence-free radio network port (available internationally – short range)
C2363A-32 *	Teleterm M3R2	Teleterm M3R2 Programmable RTU equipped with 10/100 Ethernet Port and integral 868MHz 500mW licence-free radio network port (Europe (CE) and South Africa only)
C2363A-34 *	Teleterm M3R4e	Teleterm M3R4e Programmable RTU equipped with 10/100 Ethernet Port and integral 900MHz 1W FHSS licence-free radio network port (USA, Australia only)
CC030A-URTT	ISaGRAF Initiation Code	*Order to activate ISaGRAF programming which conforms to IEC61131-3

ACCESSORIES

M1831A	MX Custom Serial Cable	RS232 Male DB9 connector (PC end) to FC11 (Target end) 2 metres.
M1833A	MX RS232/485 Serial Patch Cable	RS232/485 Female DB9 connector (M3 end) to loose ends. 2 metres.
M1838A	USB Programming Cable	USB-A to USB Mini-B cable

