TELETERM M3 Series Programmable RTU's

Model C2363A Teleterm RTU's with integrated communication ports and Ethernet.

DATASHEET

- 12 Configurable Inputs and Outputs

- Wide choice of communications options

- ISaGRAF IEC61131-3 Ready (order CC030A-URTT to activate)

- Internet Ready Comms options

- 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

- 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 M3 is a state-of-the-art range of RTU's 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 Ethernet, 3G/4G/LTE RS232 and RS485 serial and licence-free Radio in a number of frequency bands, and.

The TELETERM M3 comes with 12 universal I/O that can be configured for analogue or digital input or output according to your needs.

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 M3 makes it suitable for use in solar and battery powered applications.

The Teleterm M3 series can also be programmed in 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.

The Teleterm M3 also incorporates an SD memory card slot to support local data logging.

Typical applications for the M3 include:

- Energy Management and Remote Meter Reading.
- Monitoring of Ultra/Canberra Radiological Monitors
- Environmental Monitoring
- Remote Site Monitoring
- Utilities monitoring
- Remote inventory monitoring
- Traffic Management
- Remote Digital Advertising Sign management

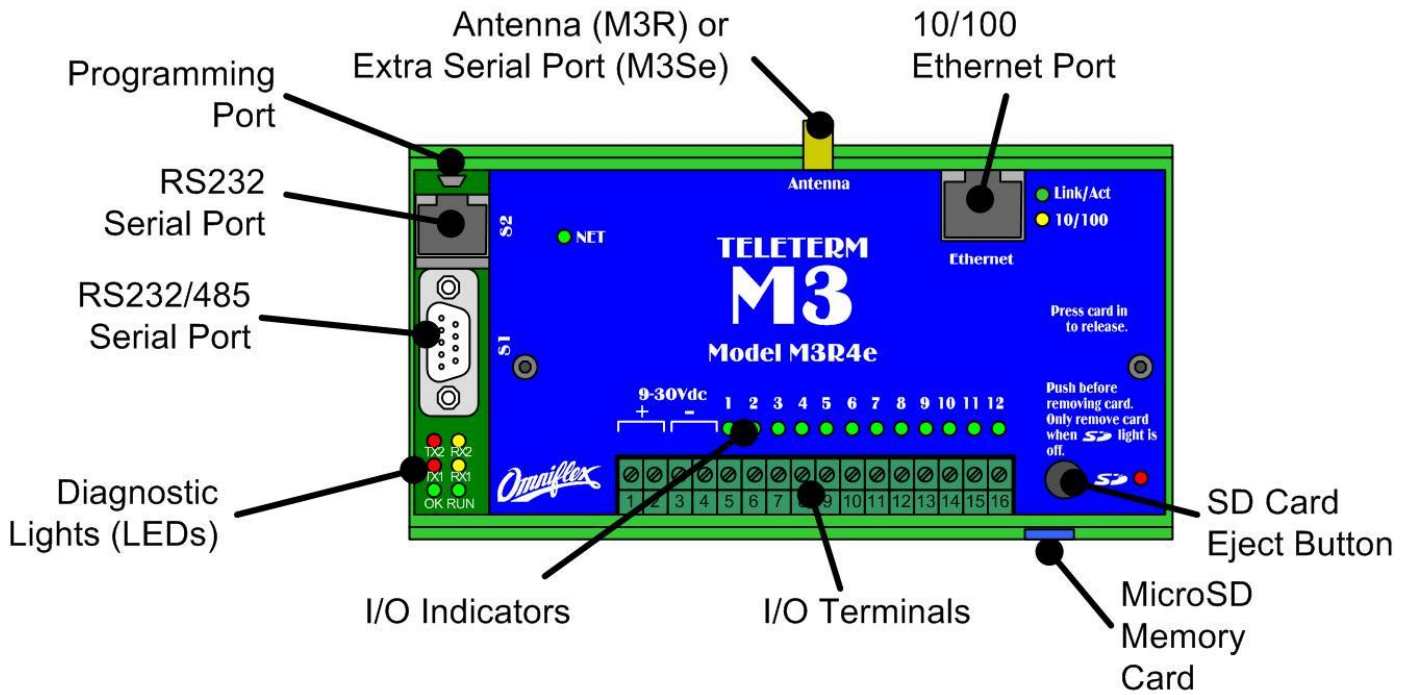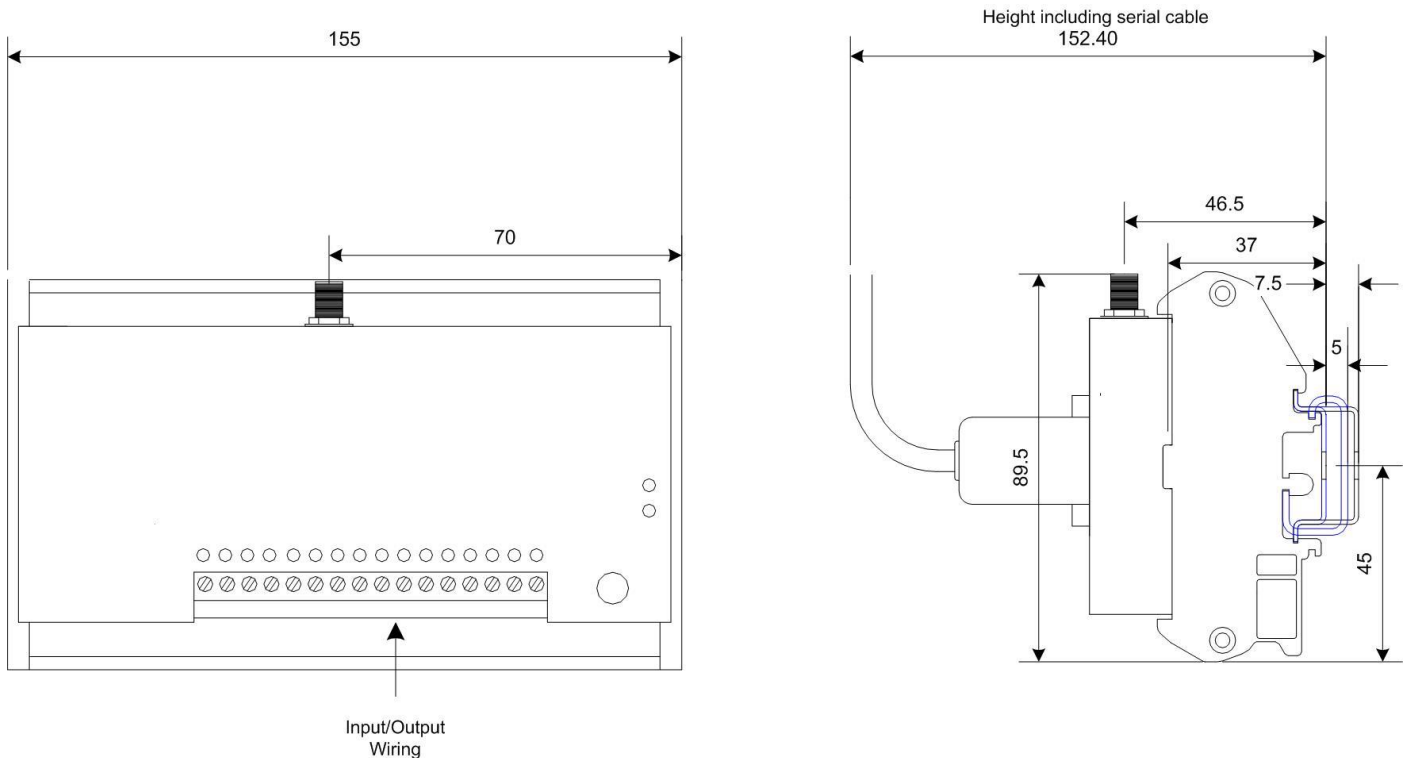Stay in touch – Take control with the Teleterm M3 Series from Omniflex.

www.omniflex.com

General Layout

Programming Port

RS232 Serial Port

RS232/485 Serial Port

Diagnostic Lights (LEDs)

Antenna (M3R) or Extra Serial Port (M3Se)

10/100 Ethernet Port

I/O Indicators

I/O Terminals

SD Card Eject Button

MicroSD Memory Card

Mechanical Dimensions

155

70

Input/Output Wiring

Height including serial cable
152.40

46.5

37

7.5

5

89.5

45

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TELETERM M3 Series Programmable RTU's

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Communication Functions by Model

Product Name	Order Code	Notes	12 I/O	10/100 Ethernet	RS232 Port	RS232/ RS485 Port	GSM/ EDGE/ GPRS Port	3G UMTS Port	2.4GHz 63mW Radio Port	868MHz 10mW Radio Port	868MHz 500mW Radio Port	920MHz 1W Radio Port	+1 RS232/ RS485 Port
M3e	C2363A-0		✓	✓	✓	✓							
M3G1e	C2363A-11	1,2	✓	✓	✓	✓	✓						
M3G2e	C2363A-12	1,3	✓	✓	✓	✓		✓					
M3R1e	C2363A-31	4,5	✓	✓	✓	✓			✓				
M3R2	C2363A-32	4,7	✓	✓	✓	✓				✓			
M3R4e	C2363A-34	4,6	✓	✓	✓	✓						✓	
M3R6	C2363A-36	4,7	✓	✓	✓	✓					✓		
M3S1e	C2363A-41	8	✓	✓	✓	✓							✓

NOTES:

1. *The M3G version is available in a number of options to conform to different GSM based networks. Please ensure that the correct unit is specified for your application.*

2. *The EGSM/GPRS port is a quad band device operating on 900/1800/850/1900MHz. This is suitable for use on most countries' GSM networks. Consult the factory for specific compatibility with your network.*

3. *The UMTS/HSPA port is a penta band device operating on 850/900/950/1900/2100MHz. This interface is approved for use on GCF-CC, R&TTE (CE), FCC/IC, A-Tick, Telstra & NTT DoCoMo networks. It is also 3G HSPA compliant.*

4. *The M3R versions are available in a number of radio band options to comply with different country regulations. Please ensure that the correct unit is specified for your application.*

5. *2.4GHz Band is suitable for all countries – short range only*

6. *920MHz Band is suitable for use in USA, Australia and New Zealand.*

7. *868MHz Band is suitable for use in Europe, and South Africa.*

8. *Although both an extra RS232 DB9 connector AND an RS485 Molex connector are provided in this version, only ONE can be in use at any ONE time.*

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REMOTE MONITORING SPECIALISTS

TELETERM M3 Series Programmable RTU's

Model C2363A Teleterm RTU's with integrated communication ports and Ethernet.

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.
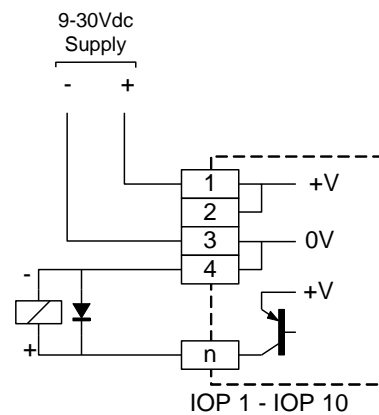*Note 2*: All 0-30V analogue inputs have increased resolution over the range 0-6V (equivalent to the 0-5V inputs).
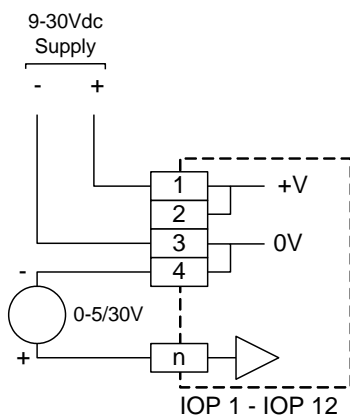*Note 3*: All Digital Inputs can be configured as Pulse Counters or Hours Counter.
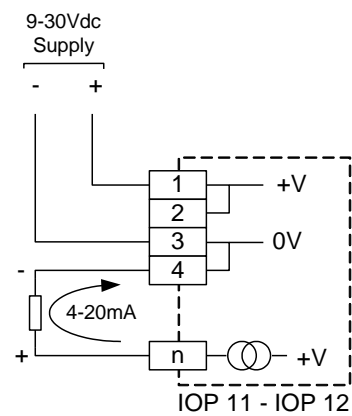*Note 4*: All Digital Outputs can be configured as Pulse outputs (normally ON or normally OFF).
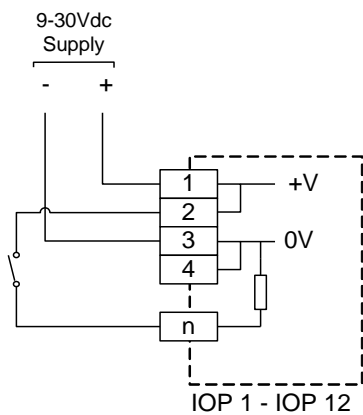
DIGITAL INPUTS

DIGITAL OUTPUTS

ANALOGUE INPUTS

ANALOGUE OUTPUTS

SPECIFICATIONS

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 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"

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.

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

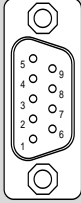|	
Safety	EN 60950
Emissions	EN 55011, Group I, Class A
Immunity – ESD	IEC 61000-4-2:2001, level 3
Immunity – RF Fields	IEC 61000-4-3:2003, level 3
Immunity – Fast Transients	IEC 61000-4-4:2004 2 kV – DC power port 1 kV – input/output lines

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).
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	Micro SD Memory Card (11mm x 15mm x 1mm)
Storage Capacity	SD Memory Card dependent: Up to 32Gb (SDHC) 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.

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 M3G1e   Model C2363A-11 (GSM/GPRS/EDGE)

Network Port

Type	GSM/GPRS mobile network

GSM/GPRS Connectivity

GSM Capability	Quad Band GSM/GPRS (900/1800/850/1900MHz) designed for SMS and data applications Fully compliant with ETSI GSM Phase 2
GPRS Capability	GPRS Class 10, PBCCH support Coding schemes: CS1 to CS4
SIM Card	Small (3Volt only)
Antenna	Remote mounted antenna connected via SMA connector on M3G.

SMS

Transmission Method	SMS's can be sent by the user program in the M3G.
Number of messages	Only limited by the installed User program. (Consult factory for application advice).

GPRS

Transmission Method	The GPRS service can be used to send UDP/IP packets or TCP/IP session data to third party applications. This is an advanced function, only recommended to experienced programmers.

Remote Programming and Configuration

Method	The Teleterm M3G allows remote dial-in for the purpose of configuration and program changes remotely. (CAUTION: GSM only supports up to 14400 baud in remote dial in, so large program downloads will be time consuming.)

Data2Desktop Service Compatibility

Secure Access to data from the M3G is made possible from a standard Web Browser using the Omniflex "Dat2Desktop" Web Service. The Omniflex "Data2Desktop" Service stays in touch with your RTU's and keeps an up-to-date copy of data in real time. This service is available by monthly subscription in selected regions.

Compatibility	The M3G is designed for full compatibility with the OMNIFLEX Data2Desktop service via GPRS. Installation of the D2D Software pack is required to connect to this service. (Consult the factory for application advice).

Network Communications Specifications for the Teleterm M3G2e Model C2363A-12 (GSM/GPRS/EDGE/HSPA [UMTS])

Network Port

Type	HSPA (UMTS) mobile network
Network Bands	850/900/1800/1900 MHz GSM/GPRS/EDGE 800/850/900/1900/2100 MHz UMTS/HSPA (WCDMA/FDD) (3G HSPA Compliant)
Approvals	GCF-CC, PTCRB-Planned, R&TTE (CE), FCC/IC, A-Tick, JPA-Planned, Telstra, NTT DoCoMo, AT&T-Planned
Antenna	Remote mounted antenna connected via SMA connector on M3G.

SMS

Transmission Method	SMS's can be sent and received by the user program.
Number of messages	Only limited by the installed User program. (Consult factory for application advice).

Remote Programming and Configuration

Method	The Teleterm M3U allows remote dial-in for the purpose of configuration and program changes remotely.

Data2Desktop Service Compatibility

Secure Access to data from the M3G is made possible from a standard Web Browser using the Omniflex "Data2Desktop" Web Service. This service is available by monthly subscription.

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

Operating Band	ISM 2.4GHz		Throughput Data Rate	9600 bits per second 10% duty cycle
Special Radio Licence Requirements	None. (operates in licence-free ISM band)		Number of Channels	12 Direct Sequence Channels
Transmit Power	63mW (+18dBm)		Outdoor Range (Urban) (Line of Sight)	90m 1.6km
Receiver Sensitivity	-100dBm typical		Antenna	RPSMA Connector for external antenna
Modulation	DSSS FSK		Approvals	Approved for use internationally
RF Data Rate	250 000 bits per second			

Network Communications Specifications for the Teleterm M3R2 C2363A-32 (868MHz 10mW)

Operating Band	SRD g3 Band (869.525 MHz)		Throughput Data Rate	1,200 to 19,200 bits per second 10% duty cycle LBT (Listen Before Talk)
Special Radio Licence Requirements	None. (operates in licence-free ISM band)		Number of Channels	Three Channels
Transmit Power	10mW (+10dBm)		Outdoor Range (Urban) (Line of Sight)	Up to 3 km with dipole Up to 6 km with hi-gain antenna
Receiver Sensitivity	-109dBm typical		Antenna	RPSMA Connector for external antenna
Modulation	FSK		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		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

Network Communications Specifications for the Teleterm M3R6 C2363A-36 (868MHz 500mW)

Operating Band	SRD g3 Band (869.525 MHz)		Throughput Data Rate	1,200 to 19,200 bits per second 10% duty cycle (LBT Listen Before Task)
Special Radio Licence Requirements	None. (operates in licence-free ISM band)		Number of Channels	Up to 10 channels (depending on baud rate)
Transmit Power	500mW (+27dBm)		Outdoor Range (Line of Sight)	Up to 20 km with dipole Up to 40 km with hi-gain antenna
Receiver Sensitivity	-109dBm typical		Antenna	RPSMA Connector for external antenna
Modulation	FSK		Approvals	Approved for use in Europe and S.Africa

Extra Serial Port Specifications for the Teleterm M3S1e   Model C2363A-41 (Extra Serial Port Version)

Network Ports

Types	1 x RS232 OR 1 x RS485 **Note:** EITHER the RS232 DB9 connector OR the RS485 Molex connector can be used in the Extra Serial Port version

RS232 Connector

Type	9 pin sub-miniature male (DB9M).
Serial Protocols supported	Supports Conet/s and Modbus ASCII and RTU − Master or Slave as standard, but other protocols may be downloaded. (Consult the factory for advice on additional protocols)
Baud Rate	300 − 38,400 baud.
Maximum cable length	15 meters (50ft) in RS232 mode

PIN	I/O	RS232	DESCRIPTION
1	I	CD	Carrier Detect
2	I	RD	Receive Data
3	O	TD	Transmit Data
4	O	DTR	Data Terminal Ready
5	-	SG	Signal Ground
6	I	DSR	Data Set Ready
7	O	RTS	Request To Send
8	I	CTS	Clear To Send
9	I	RI	Ring Indicator

RS485 Connector

Type	Molex Type 7478 (3 pins)
Serial Protocols supported	Supports Modbus ASCII and RTU − Master or Slave as standard, but other protocols may be downloaded. (Consult the factory for advice on additional protocols)
Baud Rate	300 − 38,400 baud.
Maximum cable length	1200m (4000ft) in RS485 mode

PIN	NAME	DESCRIPTION
17	0V	0V Line (if used)
18	RS485-	RS485- line
19	RS485+	RS485+ line

Ordering Information

ORDER CODE	PRODUCT	DESCRIPTION
C2363A-0	Teleterm M3e	Teleterm M3e Programmable RTU with 10/100 Ethernet Port
C2363A-11	Teleterm M3G1e	Teleterm M3Ge Programmable RTU with 10/100 Ethernet Port and integral GSM/GPRS modem.
C2363A-12	Teleterm M3G2e	Teleterm M3Ge Programmable RTU with 10/100 Ethernet Port and integral GSM/GPRS/EDGE/HSPA modem (3G HSPA compliant)
C2363A-13	Teleterm M3G2e	Teleterm M3Ge Programmable RTU with 10/100 Ethernet Port and integral GSM/GPRS/EDGE/HSPA modem (3G HSPA compliant)
C2363A-14	Teleterm M3G2e	Teleterm M3Ge Programmable RTU with 10/100 Ethernet Port and integral 4G/LTE modem (Latin America/Australia/new Zealand)
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 10mW 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)
C2363A-36	Teleterm M3R6	Teleterm M3R6 Programmable RTU equipped with 10/100 Ethernet Port and integral 868MHz 500mW licence-free radio network port (Europe (CE) and South Africa only)
C2363A-41	Teleterm M3S1e	Teleterm M3Se Programmable RTU equipped with 10/100 Ethernet Port and second and third RS232/485 serial ports.
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