CE

Omniflex
REMOTE MONITORING SPECIALISTS

INSTALLATION GUIDE
Teleterm M3 Series Programmable RTU
Model C2363A

The TELETERM M3 series is a state-of-the-art RTU range with Ethernet designed to expand the possibilities of remote monitoring and control by providing a cost effective platform with a wide range of features.

Other communications options include GSM, 3G UMTS, CDMA and licence-free Radio in a range of frequency bands, and RS232 and RS485 serial.

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 powered and battery powered applications.

The Teleterm M3 series can also be programmed in 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.

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

Application Examples

- Monitoring of Ultra/Canberra Radiological Monitors
- Environmental Monitoring
- Remote Site Monitoring
- Traffic Management

- Energy Management and Remote Meter Reading.
- Utilities monitoring
- Remote inventory monitoring
- Transport Cargo Monitoring

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.
- Compact size for tight space

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

Getting Started

Thank you for choosing the Teleterm M3 Series RTU from Omniflex for your remote communication needs.

To configure your M3, use our Omniset software which can be downloaded from the Omniflex website at www.omniflex.com.

Register on the website to download this software for free. Once the registration is complete, download the software from http://www.omniflex.com/dsview.php?hid=CC001A.

We recommend that you read the User Manual to get best results from your M3 which can also be downloaded from the website at: http://www.omniflex.com/dsview.php?hid=C2363A-0.
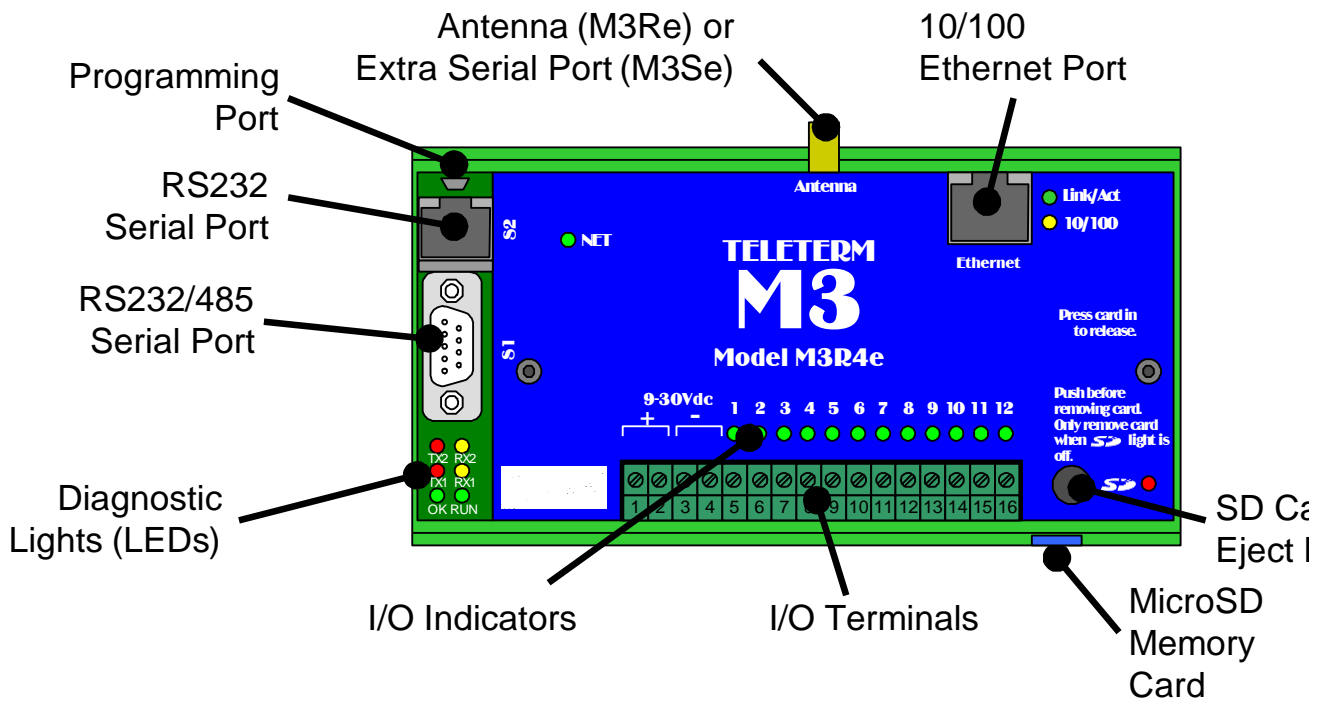
Quick Start Guide

Follow these simple steps to get started using your M3 in the shortest possible time.

1. Mount the M3 in a suitable location,
2. Connect the stub antenna supplied (if applicable). Do not over tighten. Finger tight is quite acceptable,
3. Install the microSD card into the microSD card slot of the M3,
4. Power up the unit (9-30Vdc),
5. Once you have downloaded the Omniset software (see "Getting Started"), install the software on to a PC/Laptop equipped with a USB port,
6. Plug the supplied USB cable into a spare USB port on the PC/Laptop and into the programming port of the M3,
7. Wait for Microsoft Windows to install the drivers for the unit,
8. Go to "Device Manager" in Windows and locate the COM port number for "STMicroelectronics Virtual COM Port" such as COM4,
9. Register the Omniset software and once it has been registered, open Omniset (located under "All Programs", "Omniflex", and allow the software to automatically update the software,
10. If there is an error message occurs about invalid port, acknowledge the error and click on the "Options" menu and "Port Settings" and change the port number to the number recorded in Step 8,
11. Click on "File Connect" and Omniset will read the product information from the Silent Sentry and load the correct template for the product,
12. The M3 can now be configured for use.

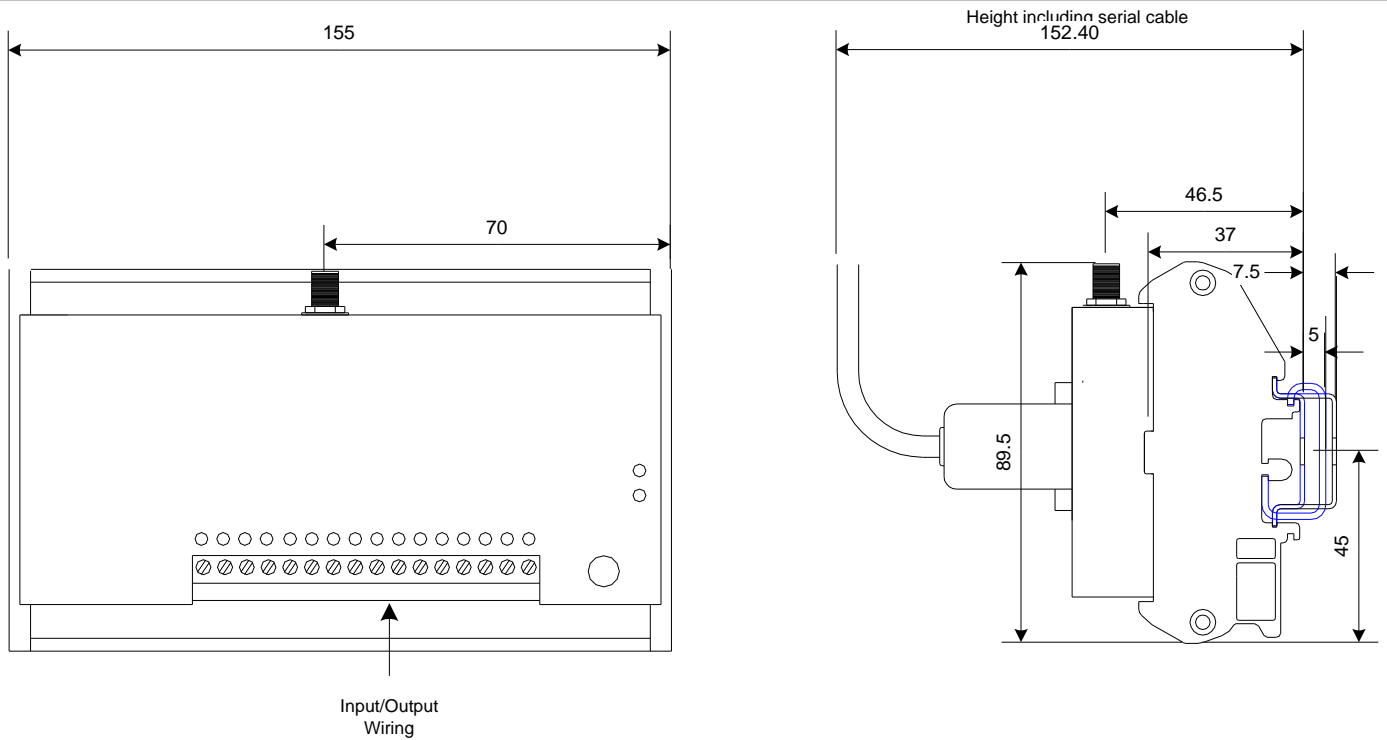Remember to download the User Manual for more details of the important features of the product from http://www.omniflex.com/dsview.php?hid=C2363A-0.

Technical support is available by email at techsupport@omniflex.com or contact your local supplier.

General Layout

Antenna (M3Re) or Extra Serial Port (M3Se)

10/100 Ethernet Port

Programming Port

RS232 Serial Port

RS232/485 Serial Port

Diagnostic Lights (LEDs)

Antenna

S2

NET

TELETERM
M3
Model M3R4e

Link/Act
10/100
Ethernet

S1

9-30Vdc
+   -
1 2 3 4 5 6 7 8 9 10 11 12

TX2 RX2
TX1 RX1
OK RUN

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

Press card in to release.

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

SD Card Eject

I/O Indicators

I/O Terminals

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

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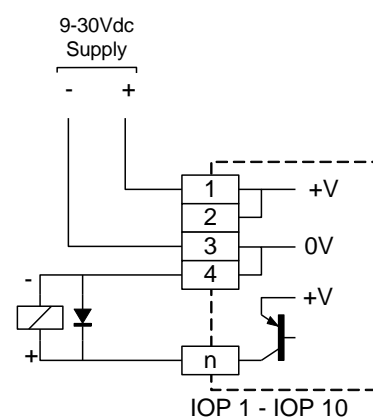*Note 2*: All 0-30V analogue inputs have increased resolution over the range 0-6V (equivalent to the 0-5V inputs).
Note 3: All Digital Inputs can be configured as Pulse Counters or Hours Counter.
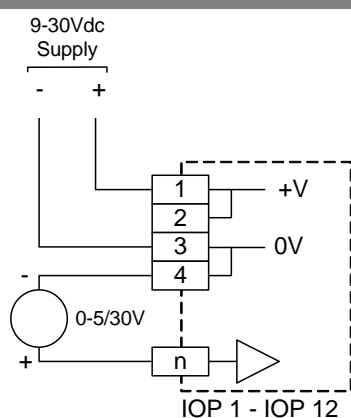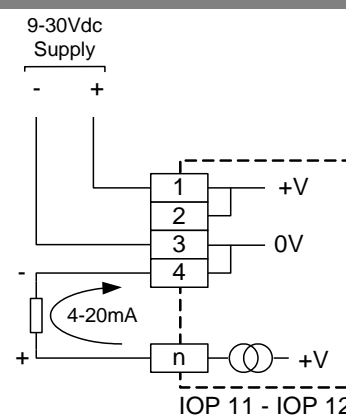*Note 4*: All Digital Outputs can be configured as Pulse outputs (normally ON or normally OFF).
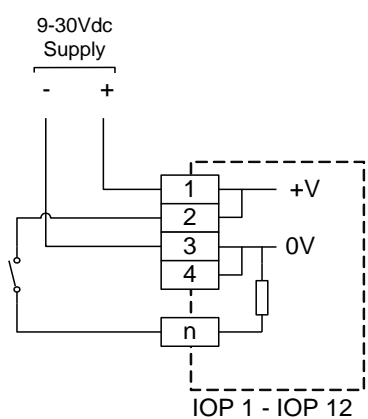
DIGITAL INPUTS

DIGITAL OUTPUTS

ANALOGUE INPUTS

ANALOGUE OUTPUTS

Specifications 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 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

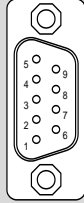| Real Time Clock	
Resolution	10ms
Accuracy	1 min per month
Battery Life	> 1 year with power off > 5 years with power on.
Battery Type	3V Lithium Cell type CR2032

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	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.

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.

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).

Communications Specifications for the Teleterm M3G2e Model C2363A-12 (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.	

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

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

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

Operating Band	SRD g3 Band (869.525 MHz)	Number of Channels	Three Channels
Special Radio Licence Requirements	None. (operates in licence-free ISM band)	Outdoor Range (Line of Sight)	Up to 20 km with dipole Up to 40 km with hi-gain antenna
Transmit Power	500mW (+27dBm)	Antenna	RPSMA Connector for external antenna
Receiver Sensitivity	-109dBm typical		
Modulation	FSK	Approvals	Approved for use in Europe and South Africa
Throughput Data Rate	1200 to 19000 bits per second 10% duty cycle(LBT)		

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

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

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-31*	Teleterm M3R1e	Teleterm M3Re 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-33*	Teleterm M3R3e	Teleterm M3Re Programmable RTU equipped with 10/100 Ethernet Port and integral 868MHz 315mW licence-free radio network port (Europe (CE) and South Africa only)
C2363A-34*	Teleterm M3R4e	Teleterm M3Re Programmable RTU equipped with 10/100 Ethernet Port and integral 900MHz 1W FHSS licence-free radio network port (USA, Australia 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