



TELETERM M2 Series Programmable RTU's

Model C236xB Teleterm RTU's with integrated communication ports.

DATASHEET

- 12 Configurable Inputs and Outputs
- Wide choice of communications options
- ISaGRAF 61131-3 Programmable
- Internet Ready Comms options
- SD Card Logging
- Low power operation



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 GSM, 3G UMTS, CDMA, licence-free Radio in a number frequency bands, Conet Industrial LAN for use over existing plant cabling, and RS232 and RS485 serial.

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 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 M2 makes it suitable for use in solar powered and battery powered applications.

The Teleterm M2 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.

The Teleterm M2 also incorporates an SD memory card slot to support local data logging.

Typical applications for the M2 include:

- Energy Management and Remote Meter Reading.
- Environmental Monitoring
- Remote Site Monitoring
- Utilities monitoring
- Remote inventory monitoring
- Traffic Management
- Remote Digital Advertising Sign management
- Transport/Cargo Monitoring
- Vending machines

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

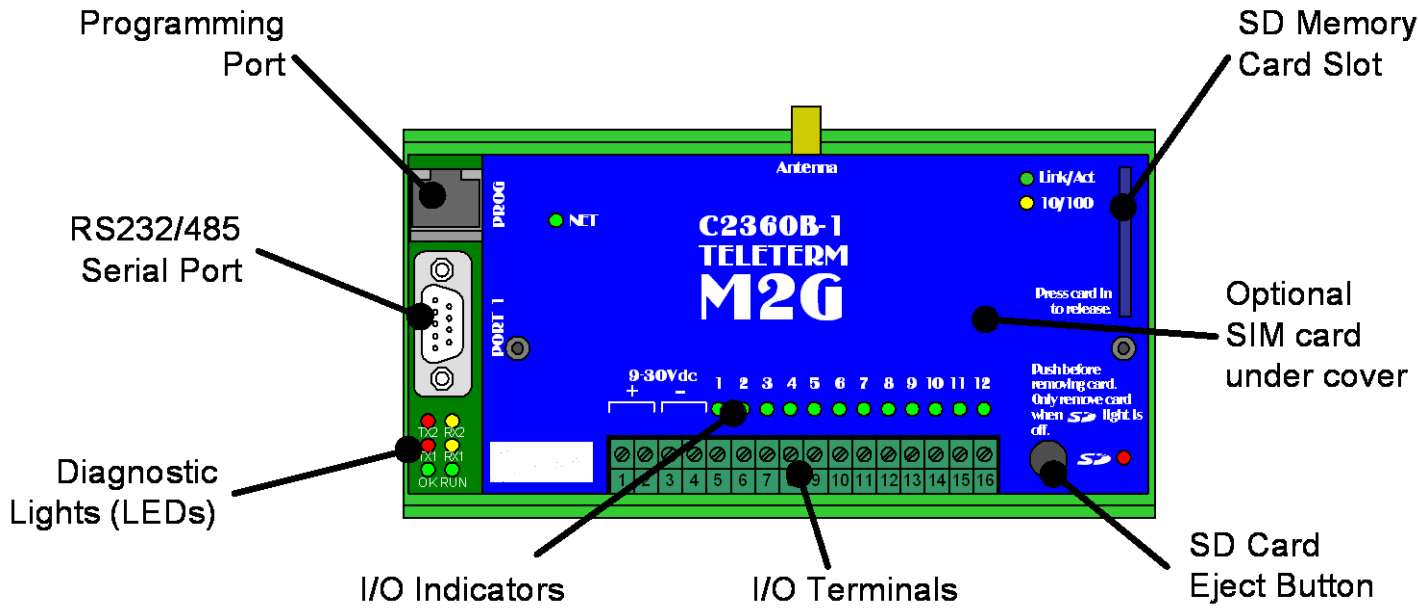




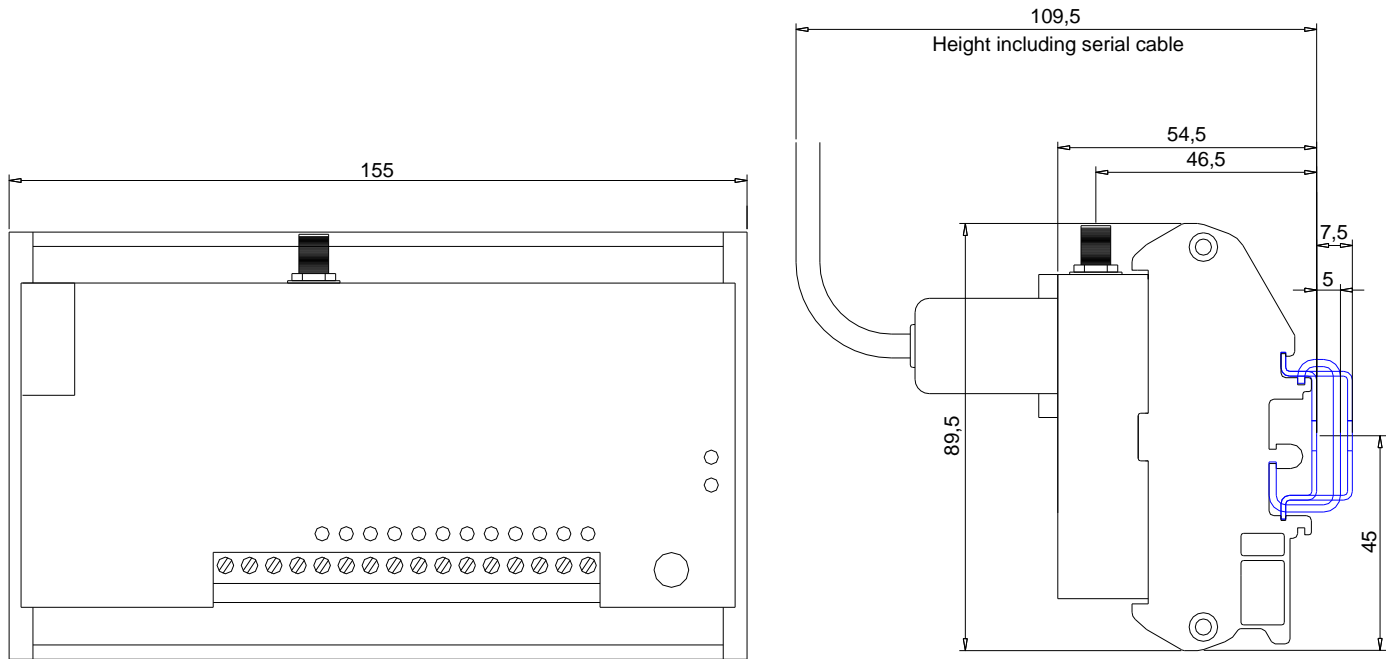
TELETERM M2 Series Programmable RTU's

Model C236xB Teleterm RTU's with integrated communication ports.

General Layout



Mechanical Dimensions





TELETERM M2 Series Programmable RTU's

Model C236xB Teleterm RTU's with integrated communication ports.

Communication Functions by Model

Product Name	Order Code	Notes	12 I/O	RS232/RS485 Port	GSM/EGSM/GPRS Port	3G UMTS Port	Conet Port	2.4GHz 63mW Radio Port	920MHz 100mW Radio Port	868MHz 315mW Radio Port	920MHz 1W Radio Port	1x RS232 1x RS232/RS485
M2	C2360B-0		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								
M2G1	C2360B-11	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							
M2G2	C2360B-12	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>						
M2C1	C2360B-21		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>					
M2R1	C2360B-31	3,4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>				
M2R2	C2360B-32	3,5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>			
M2R3	C2360B-33	3,6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>		
M2R4	C2360B-34	3,7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>	
M2S1	C2361B-41		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								<input checked="" type="checkbox"/>

NOTES:

1. 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.
2. 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.
3. 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.
4. 2.4GHz Band is suitable for use all countries.
5. 920MHz Band is suitable for use in USA, Australia and New Zealand. The M2R3 version has fixed output power of 100mW. This version is not recommended for new installations. The model has been replaced by the M2R4.
6. 868MHz Band is suitable for use in Europe, and South Africa.
7. 920MHz Band is suitable for use in USA, Australia and New Zealand. The M2R4 version has presettable output power of 1mW to 1W. This version is not compatible with M2R3 installations.





TELETERM M2 Series Programmable RTU's

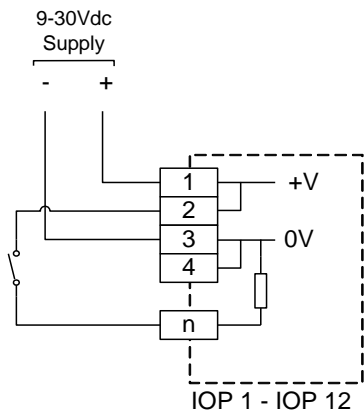
Model C236xB Teleterm RTU's with integrated communication ports.

Input/Output Configurable Options

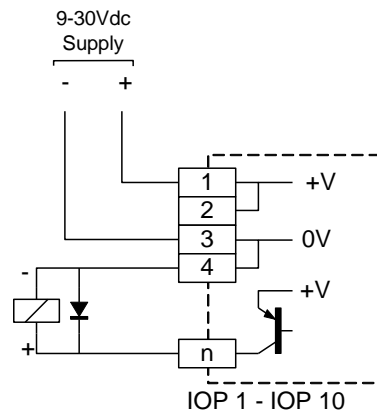
The M2G is equipped with 12 versatile input/output points (I/O points or IOP's). Each I/O point can be individually configured from the options given in the following table:

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

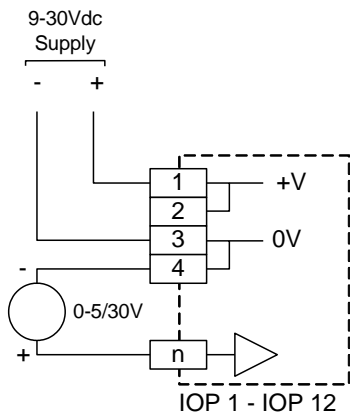
- Note 1:** See the "Specifications" section of this document for detailed specifications of each I/O point option.
- Note 2:** All 0-30V analogue inputs have increased resolution over the range 0-6V (equivalent to the 0-5V inputs).
- Note 3:** All Digital Inputs can be configured as Pulse Counters or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



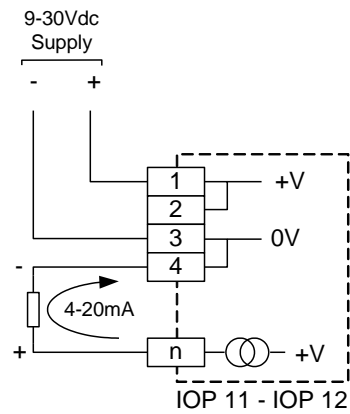
DIGITAL INPUTS



DIGITAL OUTPUTS



ANALOGUE INPUTS



ANALOGUE OUTPUTS



TELETERM M2 Series Programmable RTU's

Model C236xB Teleterm RTU's with integrated communication ports.

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: $R_{max} = (V_{supply} - 5V) \div .02 \text{ ohms}$ 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”

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	350g/250g approx.
-----------------	-------------------





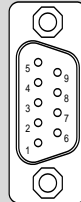
TELETERM M2 Series Programmable RTU's

Model C236xB Teleterm RTU's with integrated communication ports.

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). • 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 M2G1(e) Model C236xB-11 (EGSM/GPRS)

Network Port	
Type	GSM/GPRS mobile network
GSM/GPRS Connectivity	
GSM Capability	Quad Band EGSM/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 M2G.
SMS	
Transmission Method	SMS's can be sent by the user program in the M2G.
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 M2G 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 M2G 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 M2G 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 Comms Specifications for the Teleterm M2G2(e) Model C236xB-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 M2G.



TELETERM M2 Series Programmable RTU's

Model C236xB Teleterm RTU's with integrated communication ports.

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 M2U allows remote dial-in for the purpose of configuration and program changes remotely.
--------	---

Data2Desktop Service Compatibility

Secure Access to data from the M2G is made possible from a standard Web Browser using the Omniflex "Data2Desktop" Web Service. This service is available by monthly subscription. (D2D software pack required to be installed on M2U)

Network Communications Specifications for the Teleterm M2S1(e)

Network Ports

Types	1 x RS232 1 x RS232/485
-------	----------------------------

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)

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

Modem Power Connector

Type	Molex Type 7478 (3 pins)
Uses	This connector may be used to power an external modem

PIN	NAME	DESCRIPTION
1	+Vs	+V supply voltage (switched) 1A max
2	RD	+5Vdc (250mA max.)
3	TD	0V return

Network Communications Specifications for the Teleterm M2C1(e)

Network Port

Type	CONET Industrial LAN
Applications	(token passing peer-to-peer network designed to operate on existing plant cabling).

Baud Rates	62.5 kBaud on Standard Baud Rate 7800 Baud on Slow Baud Rate.
Cable length	10km maximum
No of nodes	126 max on one network

Network Communications Specifications for the Teleterm M2R1(e) Model C236xB-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
Serial Data Rate	9,600 bits per second
Indoor/Urban Range	90m
Outdoor (LOS)	1 km
Antenna	RPSMA Connector for external antenna
Approvals	Approved for use internationally

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

Operating Band	915-926 MHz
Special Radio Licence Requirements	None. (operates in licence-free ISM band)
Transmit Power	100mW (+20dBm)
Receiver Sensitivity	-110dBm typical
Modulation	DSSS FSK

Throughput Data Rate	9600 bits per second
Number of Channels	7 Frequency Hopping Sequences
Outdoor Range (Line of Sight)	Up to 1 km with dipole Up to 8 km with hi-gain antenna
Antenna	RPSMA Connector for external antenna
Approvals	Approved for use in USA and Australia





TELETERM M2 Series Programmable RTU's

Model C236xB Teleterm RTU's with integrated communication ports.

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

ORDER CODE	PRODUCT	DESCRIPTION
C2360B-0 – x	Teleterm M2	Teleterm M2G Programmable RTU
C2360B-11 – x	Teleterm M2G1	Teleterm M2G Programmable RTU with GSM/GPRS integral modem.
C2360B-12 – x	Teleterm M2G2	Teleterm M2G Programmable RTU with GSM/GPRS/EDGE/HSPA integral modem (3G HSPA compliant)
C2360B-21 – x	Teleterm M2C1	Teleterm M2C Programmable RTU equipped with CONET network port.
C2360B-31 – x	Teleterm M2R1	Teleterm M2R Programmable RTU equipped with integral 2.4GHz FHSS licence-free radio network port (Internationally acceptable)
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.

x = 1 for ISaGRAF IEC61131 Programming option; 0 or omit if not required.

ACCESSORIES

C6169	Conet Terminator Board	
M1831A	MX Programming Cable	RS232 Male DB9 connector (PC end) to FC11 (Target end) 2 metres.
M1832A	Conet Patch Cable	Male DB9 connector (CPU end) to loose ends. 2 metres. Use to connect M2C to C6169 Conet Terminator.
M1833A	MX RS232/485 Serial Patch Cable	RS232/485 Female DB9 connector (M2 end) to loose ends. 2 metres.

