Teleterm E3 Meter Concentrator Module

Teleterm E3 RTU with Ethernet/Radio/GSM and 8 universal I/O

Model Number
C2397A

DATASHEET

- Remotely monitor and report on your utilities from any web browser in real time.
- Compatible with the Omnergy cloud service
- Fits into your electrical switchboard
- Use at single sites, large buildings, campuses or geographically spread facilities.
- Monitor Electricity, Gas, Water, Steam, Air, Waste Water etc. for cost allocation and Carbon Footprint calculations.
- Designed for Energy Rating compliance (BREEAM/LEEDS/NABERS/Green Star)
- 1 microLAN sensor bus

Omnergy COMPATIBLE

Features

- 8 Direct Pulse or contact Inputs
- Built-in Ethernet port
- Up to 32 Modbus Meters or other devices
- SD Card stores up to 1 year's data if off-line
- Integral Real-Time Clock with Battery Backup
- 85 - 264V ac or 9 - 30Vdc powered with battery backup
- Standard 9 module DIN 43880 size

Overview

The **Omnergy E3** meter concentrator module is designed for remote meter data acquisition over Ethernet or GSM mobile phone networks for wide area utilities monitoring.

Communications options include GSM, 3G UMTS, 5G, CDMA, licence-free Radio in a number frequency bands, and RS232 and RS485 serial.

To meet energy ratings compliance requirements, utility consumption must meet set targets over time. This requires reliable regular reading of sub-metering points for the appropriate allocation, analysis and reporting of energy consumption across the facility. Up to 8 pulse meters and 32 Modbus meters can be monitored simultaneously on a single Teleterm E3 Module.

Meter independence allows integration with existing meter infrastructure.

Omnergy Data Service

Using the Teleterm E3 module, electricity, water and gas meters can be monitored over a wide area and aggregated using the compatible web based Omnergy Data Service to establish a "green" compliant energy monitoring system.

By utilising on-line meter monitoring, the Omnergy system can generate alarms and reports in real time to allow proactive management of utilities. Features such as closed system loss reporting on groups of meters, predictive energy targeting, and real-time dash-boards accessible by all users, provide key benefits to operators using these modules.

Meter Data Accumulation

Two on board serial ports can be used to send and receive data from third party devices using the Modbus protocol. For example, one port can be used to interface to a local HMI (touch screen) for local control and monitoring, and the second port can be used to communicate with a pump controller or variable speed drive. By downloading a custom software protocol "plug-in" other third party devices can also be connected for remote monitoring or control.

Time Synchronisation

A real time clock in the module is used to timestamp all readings. When used with Omnergy, the time is regularly synchronised to the Omnergy central time.

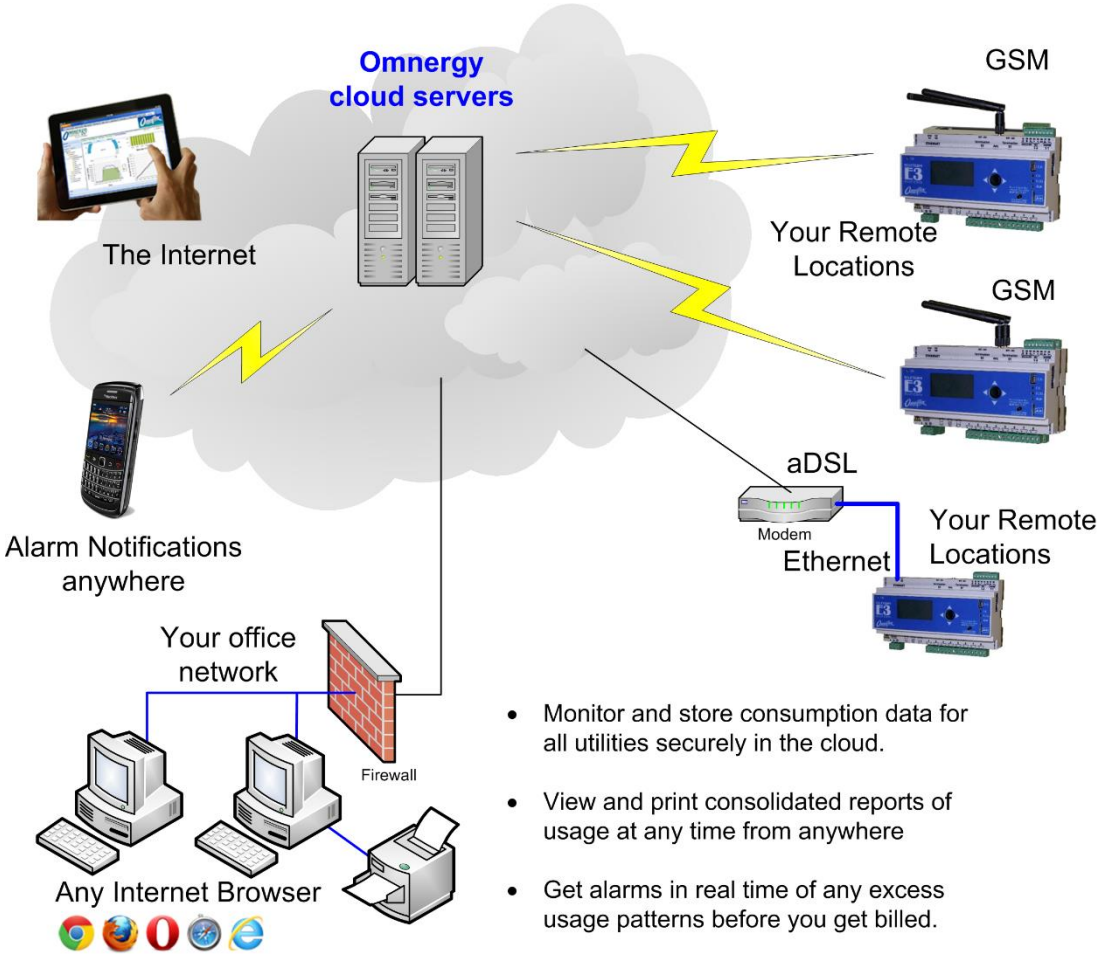
Network Loss

The Teleterm E3 Module stores interval reading data for up to one year on an SD memory card in case of network access difficulties and sends the stored interval readings to the server upon return of the network communications.

Connecting to existing Infrastructure

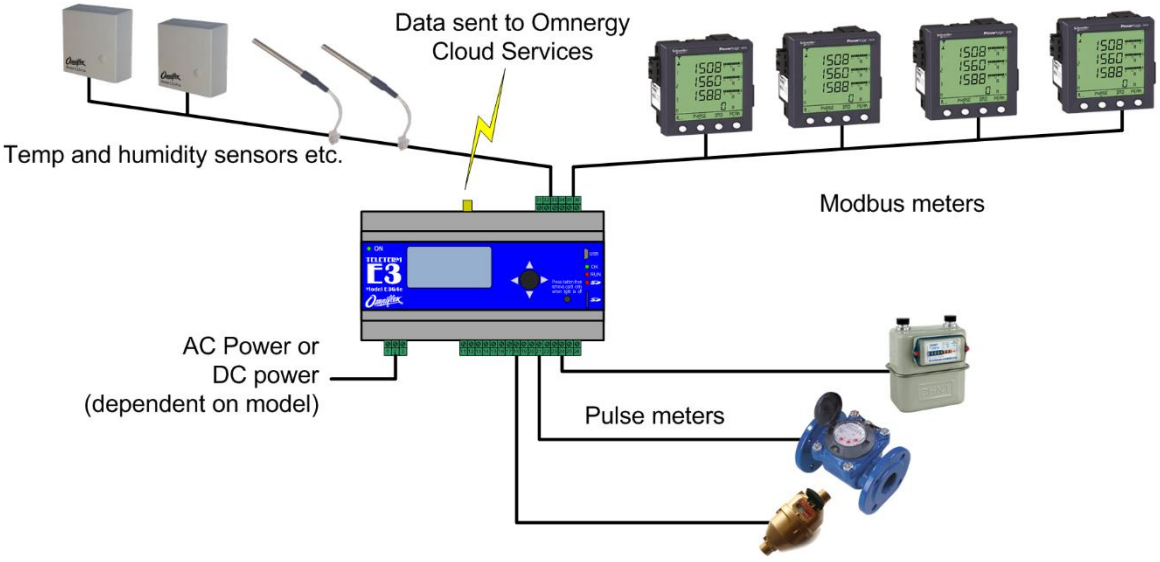
In existing installations, where existing metering infrastructure may already be connected to another system such as a Building Automation System (BAS), the Teleterm E3 can be configured to communicate with these third party systems to extract the data without the need to duplicate the metering infrastructure.

Easily manage your utilities consumption and reporting

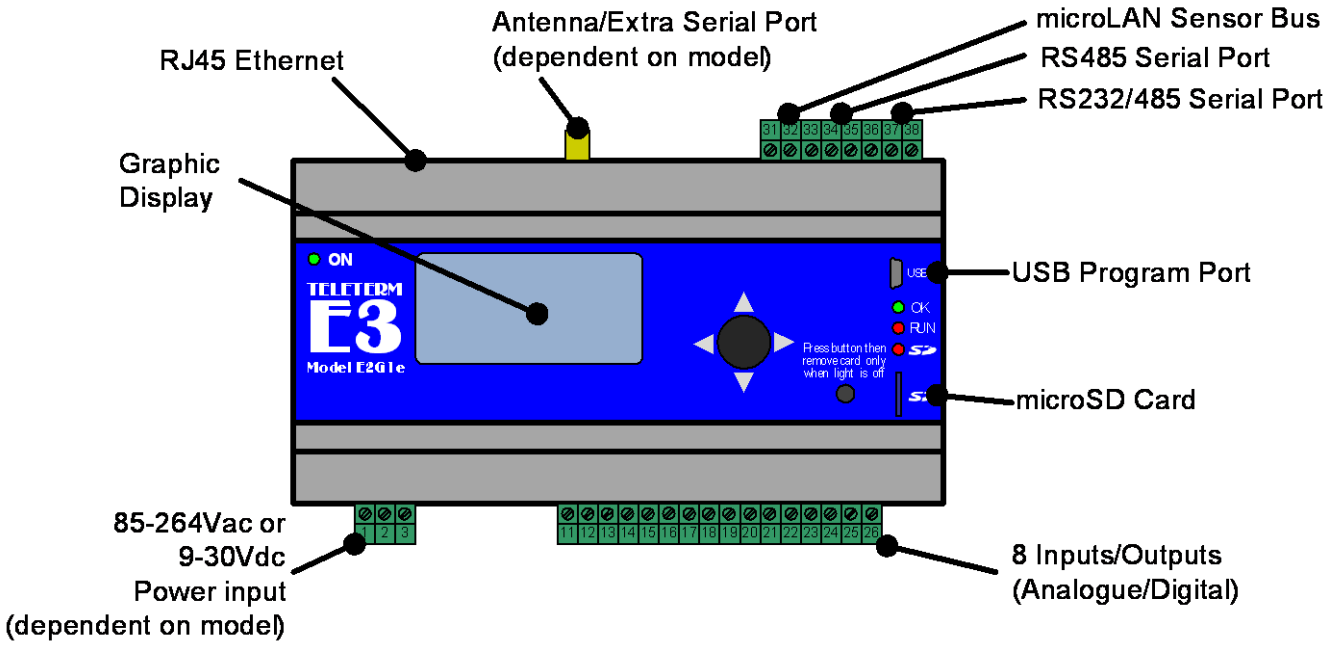


- Monitor and store consumption data for all utilities securely in the cloud.
- View and print consolidated reports of usage at any time from anywhere
- Get alarms in real time of any excess usage patterns before you get billed.

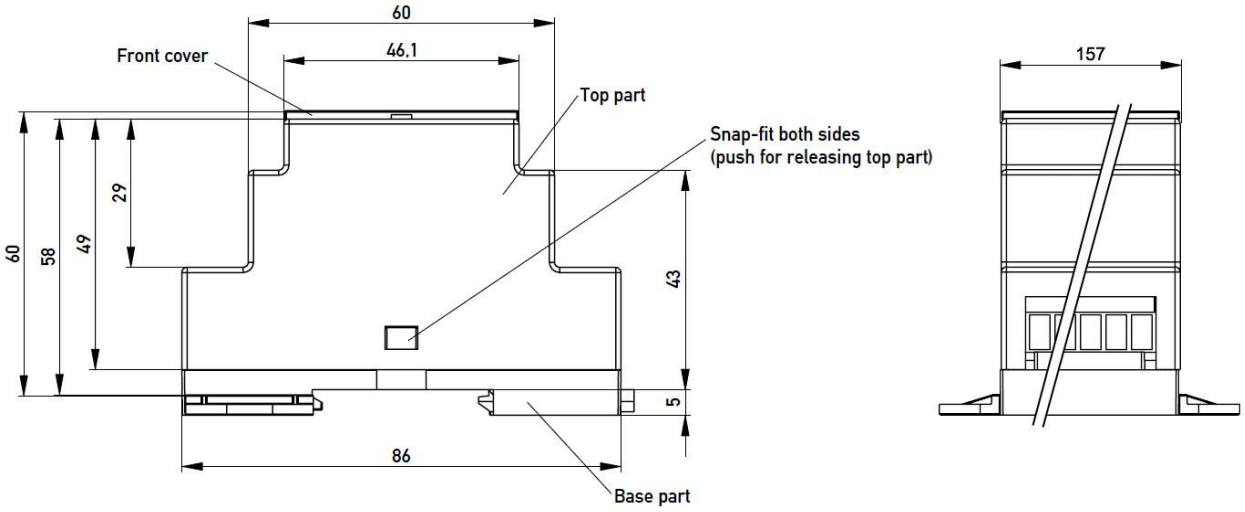
Connect to a range of sub-meters and other sensors in your premises



General Layout



Mechanical Dimensions



Communication Functions by Model

Product Name	Order Code	10/100 Ethernet	RS485 Port	RS232/ RS485 Port	4G LTE Port	5G Cat M1 /NB2	2.4.GHz 63mW Radio	169MHz 500mW Radio	433MHz 500mW Radio	464MHz 500mW Radio	868MHz 8mW Radio	868MHz 500mW Radio	920MHz 20mW Radio	920MHz 1W Radio
E3e	C2397A-X-0	✓	✓	✓										
E3G4	C2397A-X-14x	✓	✓	✓	✓									
E3G5	C2397A-X-15x	✓	✓	✓		✓								
E3R1	C2397A-X-301	✓	✓	✓			✓							
E3R2	C2397A-X-302	✓	✓	✓							✓			
E3R5	C2397A-X-305	✓	✓	✓										✓
E3R6	C2397A-X-306	✓	✓	✓								✓		
E3R7	C2397A-X-307	✓	✓	✓				✓						
E3R8	C2397A-X-308	✓	✓	✓					✓					
E3R9	C2397A-X-309	✓	✓	✓						✓				
E3R10	C2397A-X-310	✓	✓	✓									✓	
E3S1#	C2397A-X-401	✓	✓	✓										

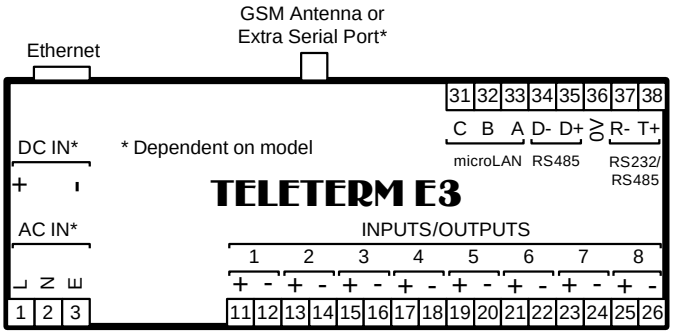
NOTES:

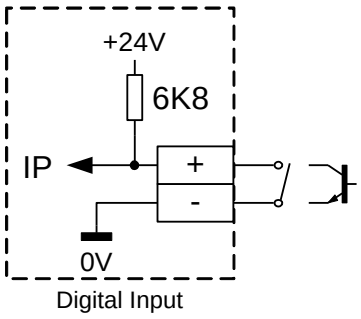
1. *The E3G versions are available in multiple options to conform to different GSM based country networks. Please ensure that the correct unit is specified for your application.*
2. *The E3R versions are available in several radio band options to comply with different country regulations. Please ensure that the correct unit is specified for your application.*
3. *2.4GHz Band is suitable for all countries – short range only.*
4. *868MHz Band is suitable for use in Europe, Middle East and Africa (Check for specific country application).*
5. *920MHz Band is suitable for use in USA, Australia and New Zealand.*
6. *The E3S# version comes with only an Extra Serial Port.*
7. *X indicates Power Supply Options: X=1 for 85-264Vac or X=2 for 9-30Vdc; see ordering options.*

Inputs and Outputs

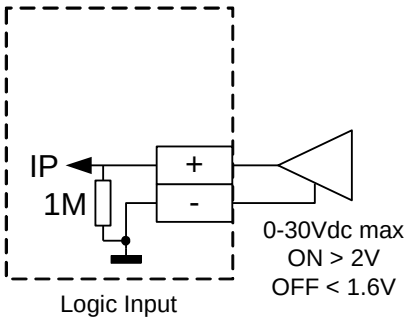
The Teleterm E3 is equipped with 8 versatile discrete input/output points (I/O points or IOP's).
Each I/O point can be individually configured to one of the following types:

TYPE	DESCRIPTION
Digital Input	On/Off signals from other equipment
Counter Input	Pulses from pulse meters
Hours Counter Input	Counts hours when the input contact is closed
Digital Output	Drives an external relay for remote control
Analogue Input	Voltage input signals in the range 0-30Vdc

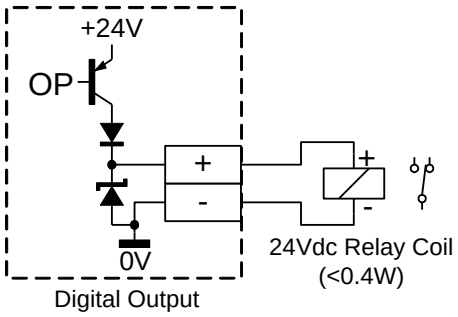




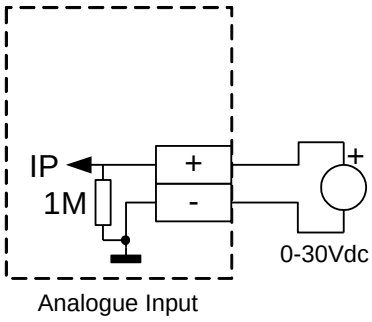
DIGITAL/PULSE INPUTS
(Volt-free Contact or NPN Transistor)



DIGITAL/PULSE INPUTS
(Logic Voltage Input)



DIGITAL OUTPUTS
(With external relay)



ANALOG INPUTS
(Voltage)

Specifications

Inputs and Outputs

The E3 module has 8 Input/Output Points (IOP) configurable in software as digital inputs, digital outputs or analogue inputs.

As Digital/Pulse Input for volt free contacts or NPN

Type	Volt free Switch (Switch to 0V to operate)
Input Impedance	6.8 kohms nominal.
Open cct. voltage	28Vdc maximum
Closed cct. current	3.5mA nominal
I/P OFF Condition	Input < 1.6Vdc
Input ON Condition	Input > 2Vdc
Functions (Software Selectable)	ON/OFF Input Counter (counts rising/falling edge pulses) Hours (counts hours while on (0.01 hrs).

As Digital/Pulse Input for logic or voltage source

Functions (Software Selectable)	ON/OFF Input Counter (counts rising/falling edge pulses) Hours (counts hours while input is on to resolution of 0.01 hours).
Type	Externally applied voltage
Input Impedance	1Megaohm nominal.
I/P OFF Condition	Input < 1.6Vdc
Input ON Condition	Input > 2Vdc (30V max).

As Digital Output

Type	Voltage Source (Solid State Switch to +V)
ON State Rated Current	< 50mA continuous maximum per output < 100mA peak (<10ms) max, per output < 115mA total for all outputs simultaneously (e.g. drives 8 x Finder 34-series 24V relays)
ON State Voltage	20.4V < V_{out} < 27.6V
OFF State Current	< 0.1mA at maximum supply voltage
Functions	Software selectable as: ON/OFF ON Pulse (configurable 10ms – 300s) OFF Pulse (configurable 10ms = 300s)

As Analogue Input

Type	Voltage Input referenced to 0V supply.
Range	0-30Vdc (software configurable to smaller ranges such as 1-5Volts)
Accuracy	< 0.15% of reading +8mV
Resolution	8mV (12 bits)

General Specifications

Power Requirements AC Version (C2397A-1-X)

AC input voltage range	85-264Vac
AC input frequency	47-63 Hz
Input current at full load	<0.1A rms
Switch-on inrush current	2A for <10ms (10A for < 1ms)
Surge withstand	2kV 1.2/50 us pulse (line to earth)

Power Requirements DC Version (C2397A-2-X)

DC input voltage range	9-30Vdc
Input current at full load	<0.33A

Battery Backup

Type	Internal Li-Ion battery
Behaviour	Keeps unit fully functional during power failures while battery lasts.
Operating time	4 hrs typical

Real Time Clock

Resolution	10ms
Accuracy	1 min per month
Clock Battery Life	> 12h (using E3 internal battery)
Clock backup	>1h (when servicing battery)

Plugin Memory Card

Type	microSD Memory Card (11mm x 15mm x 1mm)
Storage Capacity	SD Memory Card dependent: 2 to 32Gb supported
Card Format	PC Compatible FAT32 File Format
Data Format	CSV File Format compatible with Microsoft Excel etc.

Environmental Conditions

Storage Temperature	-25°C – 60 °C (-13°F – 140°F)
Operating Temperature	-10°C – 50 °C (+14°F – 122°F)

Compliance with Standards

Safety	EN 60950:2000
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 1 kV – input/output lines

Weight

Unpacked	350g approx.
Packed	550g approx.

Teleterm E3 Meter Concentrator Module

Teleterm E3 RTU with Ethernet/Radio/GSM and 8 universal I/O

Model Number
C2397A

Communication Ports - General

Serial Ports (S1 and S2)

Available on all models

Type	2-wire RS485 or RS232 (Port 1) 2-wire RS485 (Port 2)
Baud Rate	300 – 38,400 baud.
Maximum Cable length	1200m (4000ft) in RS485 mode 15m (50ft) in RS232 mode (Port 1)
Connection	screw terminals
Protocols Supported	• Modbus ASCII (master or slave) • Modbus RTU (master or slave). • Modbus/TCP (master or slave). • Conet/s • Other protocols may be downloaded. Consult the factory for available protocols

Extra Serial Port Version

Available on Teleterm E3S1 only Model C2397A-401

Serial Port

Type	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

Note: 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

Ethernet Port

Type	10/100 UTP Ethernet (RJ45)
Network Protocols	UDP/IP, TCP/IP
IP Addressing	Fixed IP set during configuration
Data Protocols	Modbus/TCP Class 0 Conet/e HTTP Client for D2D server access

microLAN Network Port

Type	1-wire Dallas bus
Operating voltage	5V (with short circuit protection)
Output capacity	12 microLAN sensors max.
Connections	A,B,C see microLAN Installation Guide

Communication Ports – Internal Licence Free Radio (on E3R versions only)

2.4GHz 63mW Radio (Model C2397A-X-301)

Operating Band	ISM 2.4GHz
Regions	International Use
Licence Requirement	None (licence-free ISM band)
Transmit Power	63mW (+18dBm)
Receiver Sensitivity	-100dBm typical
Modulation	DSSS FSK
Data Rate	9600 bits per second 10% duty cycle
Number of Channels	12 Direct Sequence Channels
Outdoor Range	Urban: 90m Line -of-Sight:1km
Network topologies	Master/slave Peer-to-peer point-to-point (all with repeater capability)
Antenna	External via RPSMA Connector

868MHz 10mW Radio (Model C2397A-X-302)

Operating Band	869.4 – 869.65 MHz
Regions	Europe, Middle East, Africa (EMEA)
Licence Requirement	None (licence-free ISM band)
Transmit Power	10mW (+10dBm)
Receiver Sensitivity	-109dBm typical
Modulation	FSK
Data Rate	1,200 to 19,200 bits per second 10% duty cycle (Listen Before Talk)

Number of Channels	3 Channels
Outdoor Range	Up to 3 km with dipole Up to 6 km with 6dB gain antenna
Network topologies	Master/slave Peer-to-peer point-to-point (all with repeater capability)
Antenna	External via RPSMA Connector

920MHz 1mW-1W Radio (Model C2397A-X-304)

Not recommended for new designs (use -305)

Operating Band	ISM 915 – 928 MHz
Regions	USA, Australia and New Zealand
Licence Requirement	None (licence-free ISM band)
Transmit Power	500mW (+27dBm)
Receiver Sensitivity	-100dBm typical
Modulation	DSSS FSK
Data Rate	9600 bits per second 10% duty cycle
Number of Channels	12 Direct Sequence Channels
Outdoor Range	Urban: 90m Line -of-Sight:1km
Network topologies	Master/slave Peer-to-peer point-to-point (all with repeater capability)
Antenna	External via RPSMA Connector

920MHz 1mW-1W Radio (Model C2397A-X-305)

Operating Band	ISM 915 – 928 MHz
Regions	USA, Australia and New Zealand
Licence Requirement	None (licence-free ISM band)
Transmit Power	Selectable up to 1W (+30dBm)
Receiver Sensitivity	Low data rate: -113dBm Med data rate: -106dBm High data rate: -103 dBm
Modulation	FHSS GFSK
RF Data Rate	Low data rate: 10 kb/s Middle data rate: 110 kb/s High data rate: 250 kb/s
Data throughput	120kb/s on high data rate
Number of Channels	10 hopping sequences share 50 freq.'s
Outdoor Range (line-of-sight)	Rural: 100km (low data rate) Urban: 15km (low data rate) indoor:300m (low data rate)
Network topologies	Master/slave Peer-to-peer point-to-point (all with repeater capability)
Antenna	External via RPSMA Connector

868MHz 500mW Radio (Model C2397A-X-306)

Operating Band	868 - 870 MHz
Regions	Europe, Middle East, Africa (EMEA), India
Licence Requirement	None (licence-free ISM band)
Transmit Power	500mW (+27dBm)
Receiver Sensitivity	-109dBm typical
Modulation	FSK
Data Rate	1,200 to 19,200 bits per second 10% duty cycle (Listen Before Talk)
Number of Channels	Up to 10 Channels (depending upon baud rate)
Outdoor Range	Up to 20 km with dipole Up to 40 km with 6dB gain antenna
Network topologies	Master/slave Peer-to-peer point-to-point (all with repeater capability)
Antenna	External via RPSMA Connector

464MHz 500mW Radio (Model C2397A-X-307)

Operating Band	463.975-464.375MHz
Regions	UK/IRL/ZA
Licence Requirement	None (licence-free ISM band)
Transmit Power	500mW (+27dBm)
Receiver Sensitivity	-109dBm typical
Modulation	FSK
Data Rate	1,200 to 19,200 bits per second
Number of Channels	5 Channels
Outdoor Range	Up to 20 km with dipole Up to 40 km with 6dB gain antenna
Network topologies	Master/slave Peer-to-peer point-to-point (all with repeater capability)
Antenna	External via RPSMA Connector

433MHz 500mW Radio (Model C2397A-X-308)

Operating Band	433-434MHz
Regions	NORDIC/EU/CE
Licence Requirement	None (licence-free ISM band)
Transmit Power	500mW (+27dBm)
Receiver Sensitivity	-109dBm typical
Modulation	FSK
Data Rate	1,200 to 19,200 bits per second
Number of Channels	Up to 10 Channels (depending upon baud rate)
Outdoor Range	Up to 20 km with dipole Up to 40 km with 6dB gain antenna
Network topologies	Master/slave Peer-to-peer point-to-point (all with repeater capability)
Antenna	External via RPSMA Connector

169MHz 500mW Radio (Model C2397A-X-309)

Operating Band	169 MHz
Regions	Europe, CE
Licence Requirement	None (licence-free ISM band)
Transmit Power	500mW (+27dBm)
Receiver Sensitivity	-109dBm typical
Modulation	FSK
Data Rate	1,200 to 19,200 bits per second

Number of Channels	Up to 10 Channels (depending upon baud rate)
Outdoor Range	Up to 20 km with dipole Up to 40 km with 6dB gain antenna
Network topologies	Master/slave Peer-to-peer point-to-point (all with repeater capability)
Antenna	External via RPSMA Connector

920MHz 1mW-1W Radio (Model C2397A-X-310)

Operating Band	ISM 915 – 928 MHz
Regions	USA, Australia and New Zealand
Licence Requirement	None (licence-free ISM band)
Transmit Power	Selectable up to 20mW (+13dBm)
Receiver Sensitivity	Low data rate: -113dBm Med data rate: -106dBm High data rate: -103 dBm
Modulation	FHSS GFSK
RF Data Rate	Low data rate: 10 kb/s Middle data rate: 110 kb/s High data rate: 250 kb/s
Data Rate	120kb/s on high data rate
Number of Channels	10 hopping sequences share 50 freq.'s
Outdoor Range (line-of-sight)	Rural: 10km (low data rate) Urban: 2.5km (low data rate) indoor:100m (low data rate)
Network topologies	Master/slave Peer-to-peer point-to-point (all with repeater capability)
Antenna	External via RPSMA Connector

Communication Ports – Internal GSM Modem (on E3G versions only)

4G/LTE Network Port EU (Model C2397A-X-141)

Region/Operator	EMEA/Thailand
Type	LTE Cat 1 mobile network
Network Bands	LTE-FDD: B1/B3/B7/B8/B20/B28A WCDMA: B1/B8 GSM/EDGE: B3/B8
Regulatory Approvals	Global: GCF Europe: CE Taiwan (China): NCC Australia/New Zealand: RCM
SIM Card	3Volt Standard SIM
Antenna	External via SMA connector.

4G/LTE Network Port AU (Model C2397A-X-142)

Region/Operator	Latin America/Australia/New Zealand
Type	LTE Cat 1 mobile network
Network Bands	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B28 LTE-TDD: B40 WCDMA: B1/B2/B5/B8 GSM/EDGE: B2/B3/B5/B8
Regulatory Approvals	North America: FCC Canada: IC Brazil: Anatel Taiwan (China): NCC Japan: JATE/TELEC Australia/New Zealand: RCM
SIM Card	3Volt Standard SIM
Antenna	External via SMA connector.

4G/LTE Network Port EU (Model C2397A-X-143)

Region/Operator	North America: AT&T/T-Mobile/ U.S. Cellular Canada: Rogers/Telus
Type	LTE Cat 1 mobile network
Network Bands	LTE-FDD: B2/B4/B12 WCDMA: B2/B4/B5
Regulatory Approvals	North America: FCC/PTCRB Canada: IC
SIM Card	3Volt Standard SIM
Antenna	External via SMA connector.

4G/LTE Network Port EU (Model C2397A-X-144)

Region/Operator	North America: Verizon
Type	LTE Cat 1 mobile network
Network Bands	LTE-FDD: B4/B13
Regulatory Approvals	Global: GCF North America: FCC
SIM Card	3Volt Standard SIM
Antenna	External via SMA connector.

5G/LTE-M Network Port (Model C2397A-X-151)

Region/Operator	Multi-Region
Type	LTE Cat M1/NB2 mobile network
Network Bands	B1, B2, B3, B4, B5, B8, B12, B13, B18, B19, B20, B25, B26, B28, B66, B71, B85
SIM Card	3Volt nano SIM
Approvals	FCC, ISED, GCF, PTCRB, Verizon, AT&T, US Cell, T-Mobile, Telus, Rogers 3, RED, Vodafone 3, Deutsche Telekom 3, KCC 3, SKT 3, Giteki, Softbank 3, KDDI 3, RCM, Telstra, ICASA 3, NCC
Antenna	External via SMA connector.

Ordering Information

ORDER CODE	PRODUCT NAME	DESCRIPTION
C2397A-X[1]-0	Teleterm E3	Teleterm E3 Remote Terminal Unit
C2397A-X[1]-141	Teleterm E3G41	Teleterm E3G Remote Terminal Unit with LTE (EMEA) Port
C2397A-X[1]-142	Teleterm E3G42	Teleterm E3G Remote Terminal Unit with LTE (AU/NZ) Port
C2397A-X[1]-151	Teleterm E3G51	Teleterm E3G Remote Terminal Unit with LTE-M/NB2 Port
C2397A-X[1]-301	Teleterm E3R1	Teleterm E3R Remote Terminal Unit with 2.4GHz 63mW Radio Port
C2397A-X[1]-302	Teleterm E3R2	Teleterm E3R Remote Terminal Unit with 868Mhz 10mW Radio Port
C2397A-X[1]-304[2]	Teleterm E3R4	Teleterm E3R Remote Terminal Unit with 920MHz 1mW-1W Radio Port
C2397A-X[1]-305	Teleterm E3R5	Teleterm E3R Remote Terminal Unit with 920MHz 1W Radio Port
C2397A-X[1]-306	Teleterm E3R6	Teleterm E3R Remote Terminal Unit with 868MHz 500mW Radio Port
C2397A-X[1]-307	Teleterm E3R7	Teleterm E3R Remote Terminal Unit with 464MHz 500mW Radio Port
C2397A-X[1]-308	Teleterm E3R8	Teleterm E3R Remote Terminal Unit with 433MHz 500mW Radio Port
C2397A-X[1]-309	Teleterm E3R9	Teleterm E3R Remote Terminal Unit with 169MHz 500mW Radio Port
C2397A-X[1]-310	Teleterm E3R10	Teleterm E3R Remote Terminal Unit with 920MHz 20mW Radio Port
C2397A-X[1]-401	Teleterm E3S1	Teleterm E3R Remote Terminal Unit with Extra Serial Port

Notes:

1. Two power supply options are available:
   X = 1 for 85 -264Vac
   X = 2 for 9-30Vdc
2. Not recommended for new installations. Use -305 or -310 instead.

e.g. Order Code is C2397A-2-141 for the Teleterm E3G RTU with 4G LTE (EMEA) Port and 9 30Vdc Power Supply

Accessories

C2311A	Teleterm WE2 Housing	Teleterm Wall Mounted IP65 housing with double pole AC isolator for Teleterm E3 modules.