Teleterm E3 Meter Concentrator Module

Model C2397A with Ethernet

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)

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, 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

Each Teleterm E3 Module will continuously monitor its connected meters, so that meter readings are always up to date, and pulse counters count every pulse from the pulse meters.

Scheduled meter readings can be set from 15 minutes to once a day to suit the application.

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.

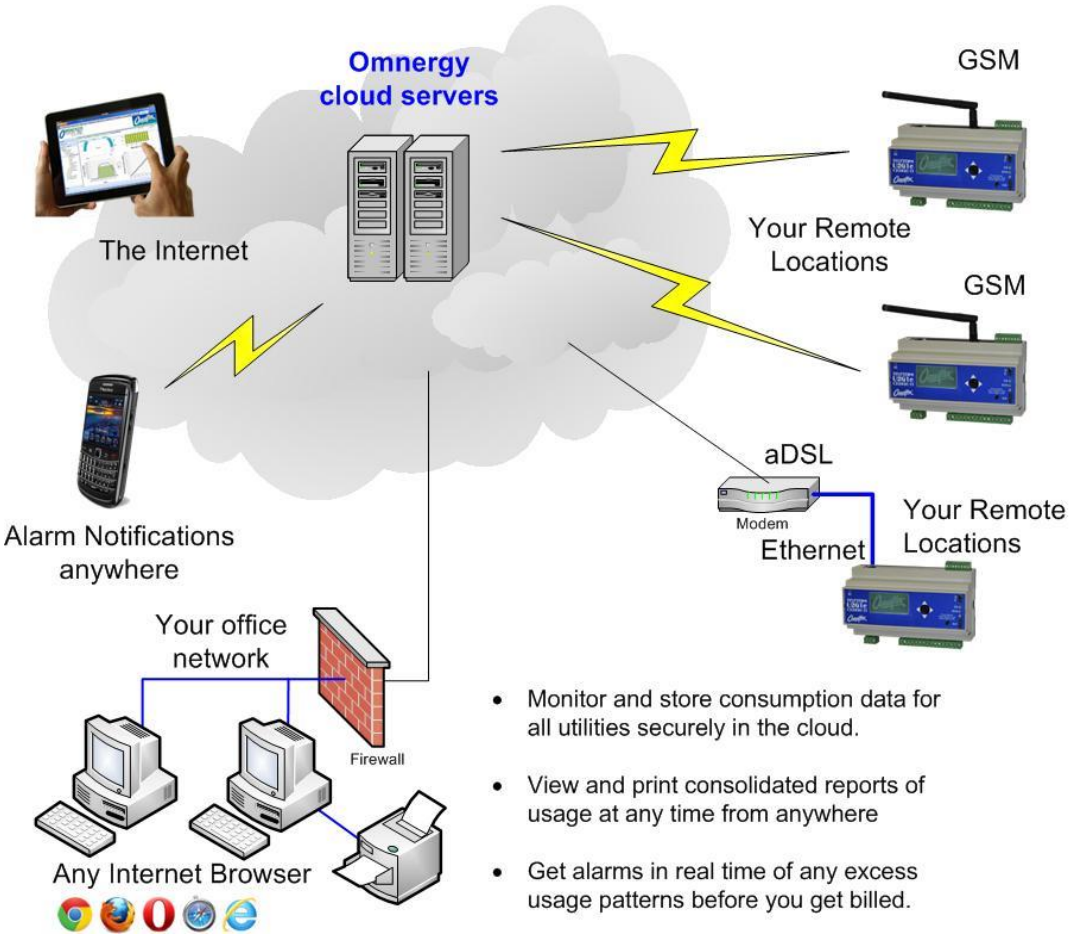
Network Loss

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

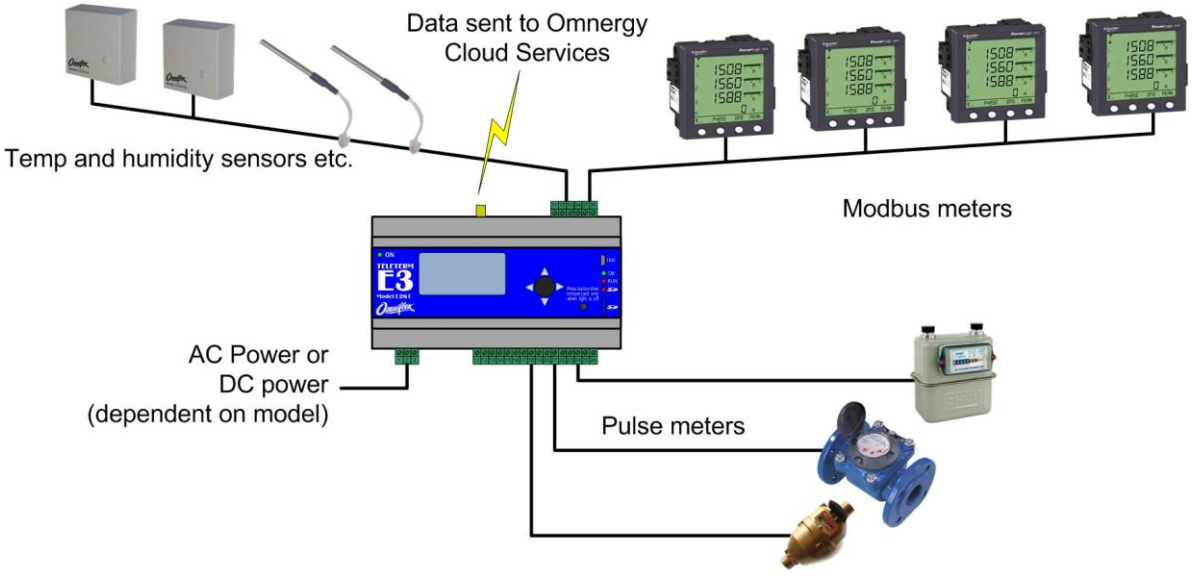
In existing installations, where existing metering infrastructure may already be connected to another system such as a Building Automation System (BAS), the Teleterm E3 can be configured to communicate with these third party systems to extract the data without the need to duplicate the metering infrastructure.

Easily manage your utilities consumption and reporting

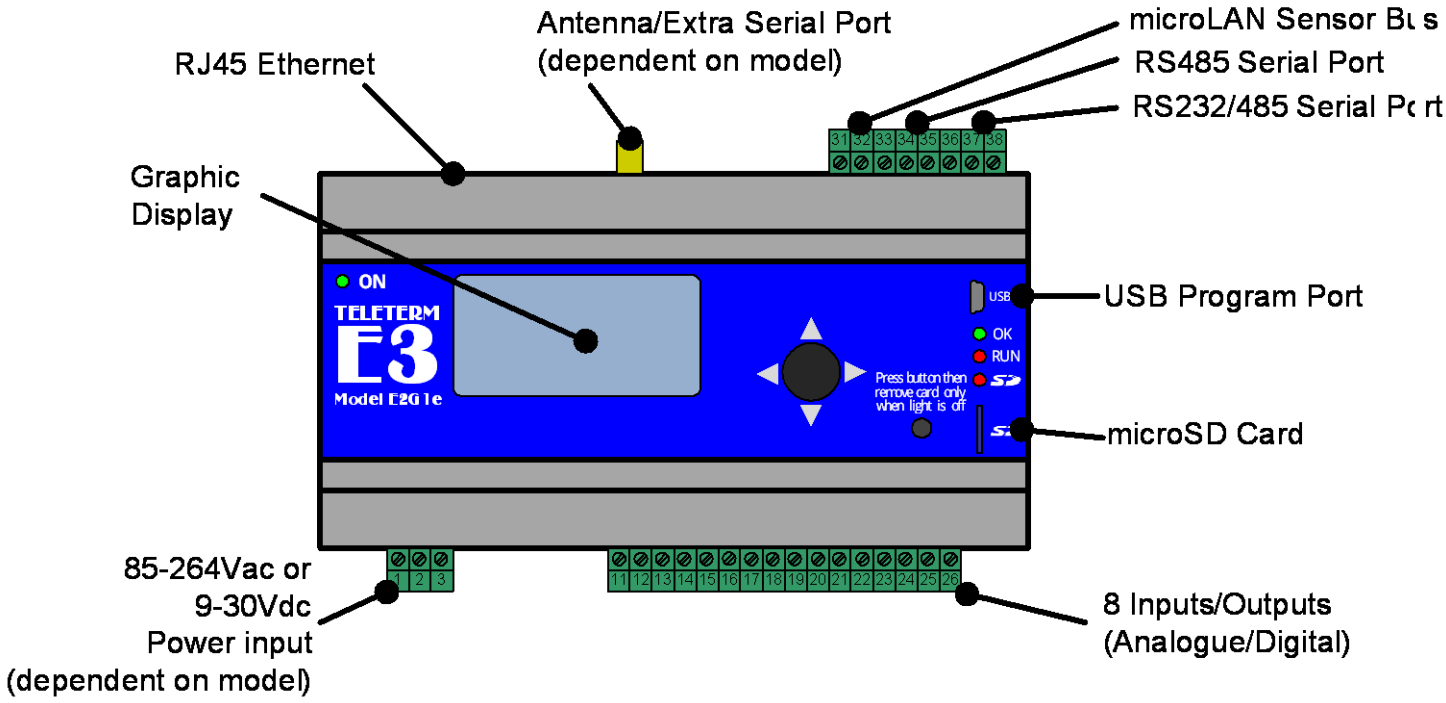


- Monitor and store consumption data for all utilities securely in the cloud.
- View and print consolidated reports of usage at any time from anywhere
- Get alarms in real time of any excess usage patterns before you get billed.

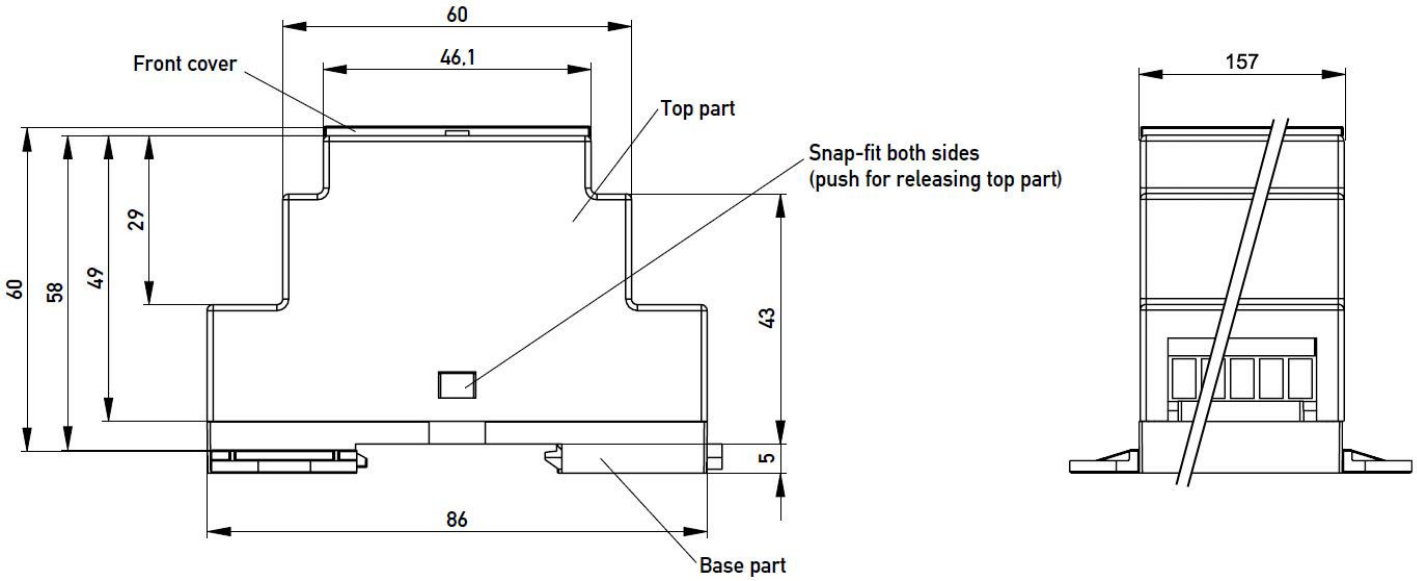
Connect to a range of sub-meters and other sensors in your premises



General Layout



Mechanical Dimensions



Communication Functions by Model

Product Name	Order Code	Notes	8 I/O	10/100 Ethernet	RS485 Port	RS232/ RS485 Port	GSM/ EDGE/ GPRS Port	3G UMTS Port	2.4GHz 63mW Radio Port	868MHz 500mW Radio Port	920MHz 1W Radio Port	+1 RS232/ RS485 Port
E3e	C2397A-X-0	9	✓	✓	✓	✓						
E3G1e	C2397A-X-11	1,2,9	✓	✓	✓	✓	✓					
E3G2e	C2397A-X-12	1,3,9	✓	✓	✓	✓		✓				
E3R1e	C2397A-X-31	4,6,9	✓	✓	✓	✓			✓			
E3R2	C2397A-X-32	4,7,9	✓	✓	✓	✓				✓		
E3R4e	C2397A-X-34	4,5,9	✓	✓	✓	✓					✓	
E3S1e	C2397A-X-41	8,9	✓	✓	✓	✓						✓

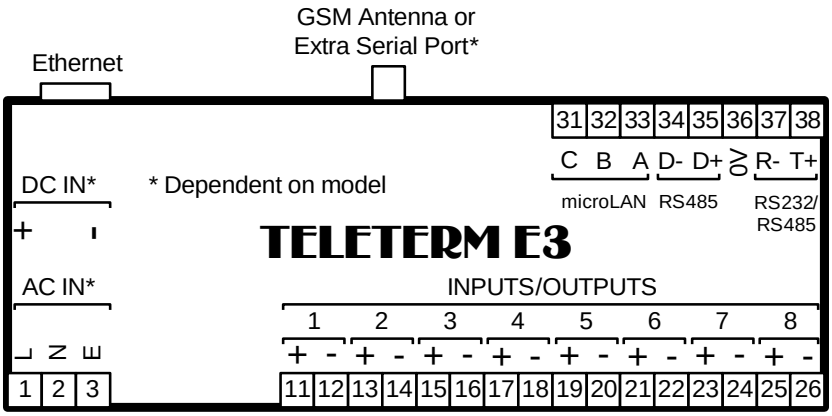
NOTES:

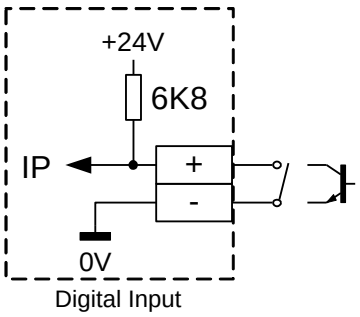
1. *The E3G version is only available in one option of GSM based networks. Please ensure that the specifications are applicable for your application.*
2. *The EGSM/GPRS port is a quad band device operating on 900/1800/850/1900MHz. This is suitable for use on most countries' GSM networks. Consult the 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 E3R version is 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. *920MHz Band is suitable for use in USA, Australia and New Zealand.*
6. *2.4GHz Band is suitable for all countries – short range only.*
7. *868Mhz Band is suitable for use in Europe, and South Africa.*
8. *Although both an RS232 DB9 connector AND an RS485 Molex connector are provided in this version, only ONE can be in use at any ONE time.*
9. *X indicates Power Supply Options: X=1 for 85-264Vac or X=2 for 9-30Vdc; see ordering options.*

Inputs and Outputs

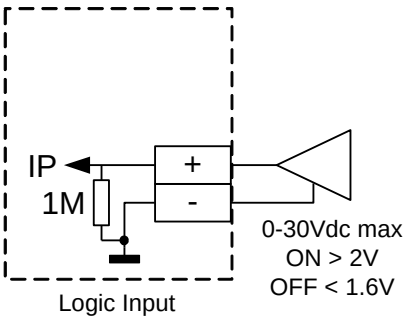
The E3 is equipped with 8 versatile discrete input/output points (I/O points or IOP's).
Each I/O point can be individually configured to one of the following types:

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

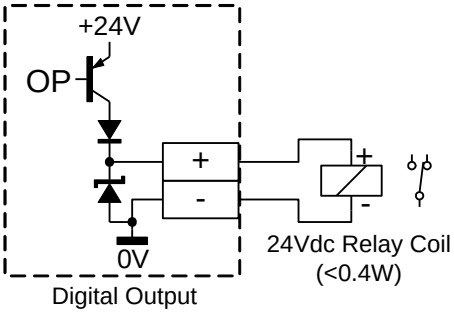




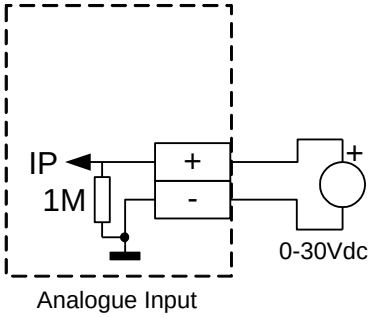
DIGITAL/PULSE INPUTS
(Volt-free Contact or NPN Transistor)



DIGITAL/PULSE INPUTS
(Logic Voltage Input)



DIGITAL OUTPUTS
(With external relay)



DIGITAL/PULSE INPUTS
(Volt-free Contacts)

Specifications

Input/Outputs

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

As a Digital/Pulse Input for volt-free contact or NPN transistor

Type	Volt free Switch (Switch to 0V to operate)
Input Impedance	6.8 kohms nominal.
Open circuit voltage	28Vdc maximum
Closed circuit current	3.5mA nominal
Input 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 input is on to resolution of 0.01 hours).

As a Digital/Pulse Input for logic or voltage source inputs

Type	Externally applied voltage
Input Impedance	1Megaohm nominal.
Input OFF Condition	Input < 1.6Vdc
Input ON Condition	Input > 2Vdc (30V max).
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).

As a Digital Output (IO Points 1 to 10)

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 < Vout < 27.6V
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

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 Back-up

Type	Internal Rechargeable Battery keeps unit fully functional during power failures.
Battery operating time	12 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)

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	350gm approx.
Packed	550gm approx.

Serial Port (1 and 2)

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 30m (100ft) in RS232 mode (Port 1)
Connection	screw terminals

Protocols Supported	• Conet/s • Modbus ASCII (Master or Slave) • Modbus RTU (Master or Slave). • Other protocols may be downloaded. Consult the factory for available protocols

Plug-in Memory Card

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

microLAN Network Port

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

GSM Network Port (Models C2397A-X-11 only)

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

3G/UMTS Network Port (Models C2397A-X-12 only)

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

GSM/3G Network Capability (Models C2397A-X-11 and -12 only)

Remote Programming and Configuration		***Omnergy Monitoring Service Compatibility***
Method	The Teleterm E3 allows access by password protected SMS for the purpose of configuration changes remotely.	Secure Access to data from the M2U is made possible from a standard Web Browser using the Omniflex “Omnergy” Web Service. This service is available by monthly subscription. Omnergy is a web based service for gathering, storing alarming and reporting of utilities metering data over wide areas. See separate datasheet for features

2.4GHz Radio Capability (Model C2397A-X-31 only)

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	Single Channel
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 international use

868MHz Radio Capability (Model C2397A-X-32 only)

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	500mW (+27dBm)	Outdoor Range (Urban) (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

Teleterm E3 Meter Concentrator Module

Model C2397A with Ethernet

DATASHEET

920MHz 1mW-1W Radio Capability (Model C2397A-X-34 only)

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

Extra Serial Port Capability (Model C2397A-X-41 only)

Network Ports

Types	1 x RS232 AND 1 x RS485 **Note:** Although both an extra RS232 and an extra RS485 connector are provided, ONLY any ONE can be used at a time in this 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.

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	15 meters (50ft)

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

Ethernet Port

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. HTTP Client for Omnergy server access
IP Addressing	Fixed IP set during configuration.

Ordering Information

ORDER CODE*	PRODUCT NAME	DESCRIPTION
C2397A-X-0	Teleterm E3e	Teleterm E3e Meter Concentrator Module with Ethernet Port
C2397A-X-11	Teleterm E3G1e	Teleterm E3G1e Meter Concentrator Module with GSM modem and Ethernet Port
C2397A-X-12	Teleterm E3G2e	Teleterm E3G2e Meter Concentrator Module with GSM/GPRS/EDGE/HSPA (3G HSPA compliant) modem and Ethernet Port
C2397A-X-31	Teleterm E3R1e	Teleterm E3R1e Meter Concentrator Module with 63mW 2.4Ghz Radio Port and Ethernet Port
C2397A-X-32	Teleterm E3R2	Teleterm E3R2 Meter Concentrator Module with 500mW 868Mhz Radio Port and Ethernet Port
C2397A-X-34	Teleterm E3R4e	Teleterm E3R3e Meter Concentrator Module with 1mW-1W 920 MHz Radio Port and Ethernet Port
C2397A-X-41	Teleterm E3S1e	Teleterm E3S1e Meter Concentrator Module with Ethernet Port and extra Serial Port

***Note**: Two power supply options are available. X= 1 for 85 -264Vac or X = 2 for 9-30Vdc

ACCESSORIES

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