



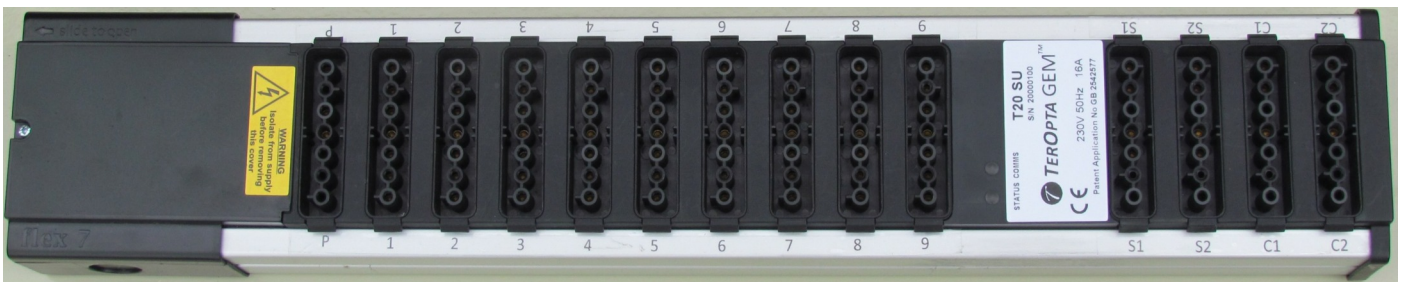
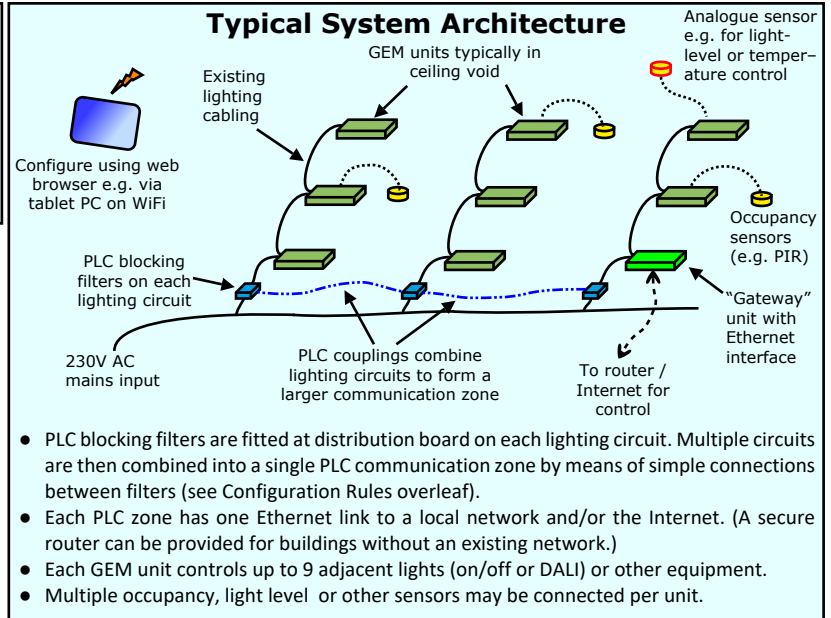
## GEM T20 Series "Graphical Energy Management"

### Overview

"GEM" is a smart building control and energy management system for commercial buildings which uses Powerline Communications (PLC), instead of dedicated control wiring. It has an industry proven 7-pole connector system for reliability and ease of installation.

GEM typically uses the building's lighting circuits for its own power and communications. It controls lighting, heating, air-conditioning, ventilation and more, using sensors.

Unit variants include Switching (on/off) and Dimming (DALI) types, each of which may be a standard unit (with powerline interface) or a Gateway unit (with powerline plus Ethernet). Units are equipped in "zones" which typically cover a room or floor in the building (see Typical System Architecture diagram, top right). One Gateway unit is required per zone. Set-up, supervision and control are performed simply using a Web Browser, with no special software required. Switching outputs use solid-state relays for high reliability - there are no relay contacts to burn out.



### Unit features

Unit No.	Type	L x W x H (mm)	Management connection (Ethernet)	Switching (on/off) outputs	Dimming (DALI) outputs	Switchable Emergency live	Switch / Sensor inputs	Power consumption (W)
T20SU	Switching Unit	523 x 90 x 49	-	9	-	✓	✓	2
T20SG	Switching Gateway	525 x 90 x 49	✓	9	-	✓	✓	3
T20DU	Dimming Unit	523 x 90 x 49	-	9	9 (single bus)	✓	✓	4
T20DG	Dimming Gateway	525 x 90 x 49	✓	9	9 (single bus)	✓	✓	4
T20FL	10A PLC filter	105 x 90 x 62	-	-	-	-	-	0

GEM units comply with:

BS EN 60950-1:2006 "Information technology equipment - Safety - Part 1: General requirements"

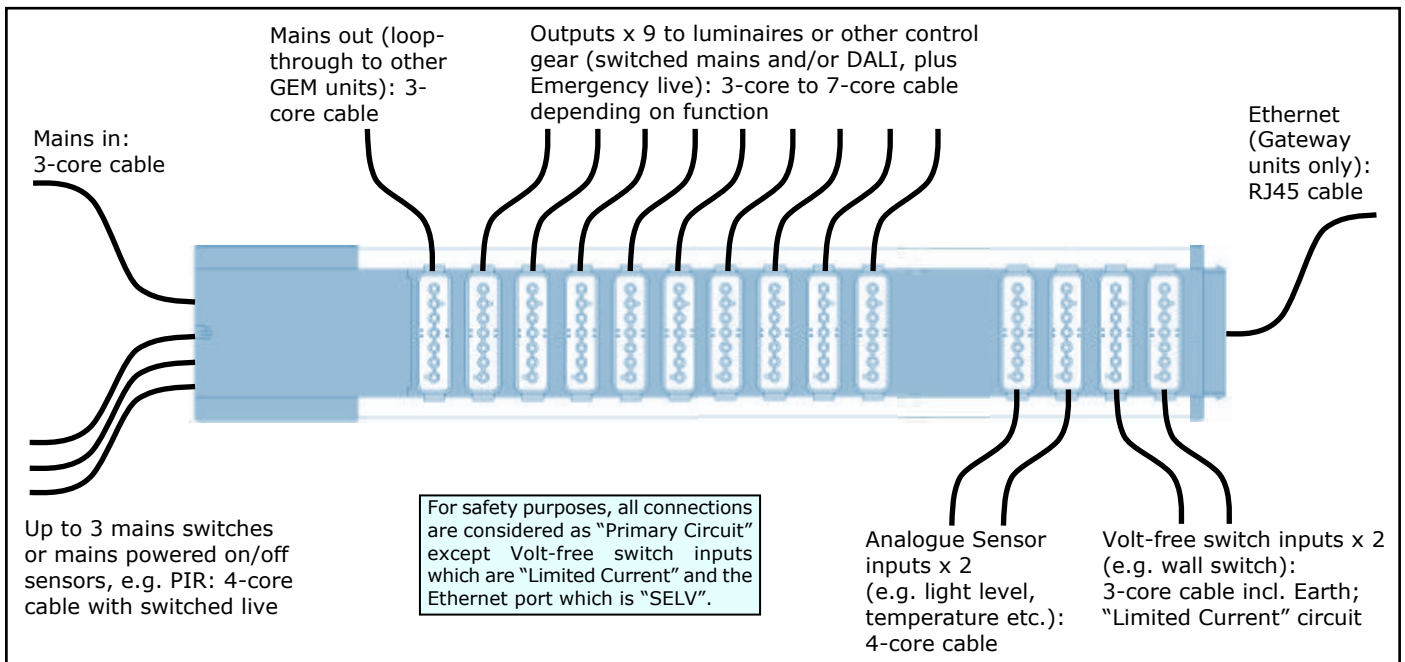
BS EN 50491-x "General Requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS)"



**Building Control - Energy Management - Agri-tech**

TerOpta Ltd  
info@teropta.com  
www.teropta.com  
+44 (0)115 888 3010

## Typical wiring



## System functions

Feature	Description	Availability
Flexible allocation of any output to sensors/switches on same or other unit	Uses graphical interface to create, remove or modify "virtual wires". Can connect to individual lights / heaters etc. or create groups to control several together.	✓
Energy saving	Use of sensors to optimise building equipment behaviour and save energy	✓
Emergency lighting test mode	All lights on → all lights off → Emergency live off for battery testing	✓
Live software upgrade	Upload new features to system whilst continuing normal operation	✓
Secure access	Critical features only accessible by authorised personnel	✓
Upload building floor plan	Simple upload of building floor plan for display on user interface	✓
Max. power per output	Power that can be driven from an individual switched output, e.g. to a luminaire. (For loads of higher power, use contactors driven from the GEM output.)	200 Watts
Max. power per unit (9 outputs)	Total power that can be supplied from a 9-output unit to luminaires etc. (not including Emergency charging power - see below)	720 Watts
Max. current from Emergency Live	All 9 main outputs provide access to the emergency lighting live feed. Total charging current drawn from one GEM unit must not exceed this value.	600 mA
Max. current available to Sensors	Both analogue sensor inputs can provide a 16V DC supply to attached sensor devices. (NB. these are NOT SELV interfaces, so can be routed with mains.)	60 mA per input (120 mA total)

## Configuration rules for estimating / ordering

- Use 1 PLC filter per lighting circuit, up to 10A. Up to 3 circuits can be linked simply by wiring between the PLC coupling ports on their respective blocking filters to form a single PLC 'zone'.
- Equip any number of GEM units per zone in any combination up to maximum loading on circuits, depending on connected luminaires (or other equipment powered directly from the GEM outputs).
- Include 1 Gateway unit per zone (can be anywhere within zone, not necessarily closest to filter). 1 Ethernet connection required per Gateway - either connected to building LAN or separate router, e.g. WiFi.
- Connect up to 3 switched mains sensors / switches, up to 2 analogue 0-10V sensors and up to 2 volt-free switch inputs per unit (these may control outputs on any unit in any zone visible on the same Graphical User Interface).



**Building Control - Energy Management - Agri-tech**

TerOpta Ltd  
 info@teropta.com  
 www.teropta.com  
 +44 (0)115 888 3010