

Extended Ethernet

EE2CL

User Manual

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1 Overview

1.1 Introduction

This manual covers the EE2CL series. These units make it possible to upgrade installed analogue cameras to high-quality digital IP cameras without the expense of replacing existing coaxial cabling. Units are available in an extended temperature range, compact wall-mount format that fits inside most camera housings and can also be mounted into a 19" rack unit.

1.1.1 EE2CL

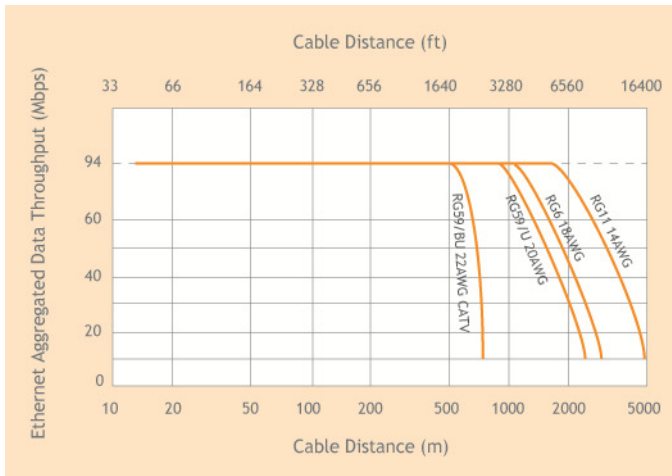
The KBC EE2CL series is a 10/100, IEEE 802.3 af/at PoE compliant, Ethernet line driver providing excellent repeatable performance for today's CCTV systems. The line driver provides connectivity for up to four, 10/100Mbps IEEE standard twisted pair copper port over a 75 Ω coaxial cable interface allowing new IP technology to pass over existing legacy cable up to a distance of 1.5km⁽¹⁾. The units are 'Plug and Play' and are automatically configured for straight forward installation. Maximum data rates of up to 100Mbps are achievable.

1. Transmission distances are for indication purposes only. Actual achievable transmission distances on site will depend on cable type installed, quality and age of installation

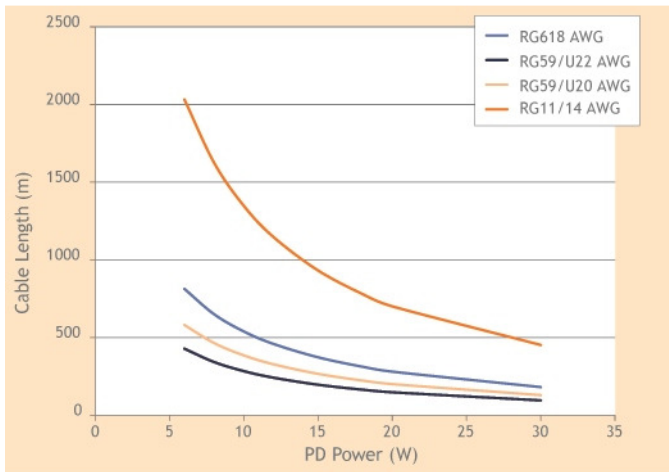
1.2 Technical Specification

Standards	
IEEE Standard	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX IEEE 802.3x Full Duplex IEEE 802.3af/at
RJ45 Port (Ethernet)	
Data Format	Ethernet
Data Rate	10/100Mbps half / full duplex auto negotiation
Coax	
Transmission Distance ⁽¹⁾	1.5km / 5000ft
Cable Type	RG59 or similar
Cable Impedance	75Ω
Electromagnetic compatibility	
Interference	Class A
Power	
Input voltage	100 – 240Vac, 50 – 60Hz
Output	48Vdc / 0.8A / Optional 0.8 – 1.3A
Power Consumption	25W
Mechanical	
Dimensions (Compact W x H x D)	75mm x 45mm x 45mm 2.95" x 1.57" x 1.57"
Weight	0.12Kg / 4.2oz
Environmental	
Operating temperature	-40°C ~ +74°C / -40° ~ +165°F
Storage temperature	-40°C ~ +74°C / -40° ~ +165°F
Relative humidity	0% ~ 85% non-condensing
Mean Time Between Failure	>100,000 hours
Connectors	
10/100 Electrical	1 x RJ45
Coax	1 x BNC, 75Ω coaxial
Power	Jack socket, 2.5mm

1.2.1 Data Throughput over Cable Length



1.2.2 Power Supplied over Cable Length⁽¹⁾ (PSE = 48V)



1. Transmission distances supplied are for indication purposes only. Actual achievable transmission distances on site will depend on cable type installed, quality and age of installation.

2 Installation

2.1 Package Contents

EE2CL-1KT

- 2 x Extended Ethernet units
- 1 x 48Vdc, 1.25A PoE Power Supply Unit
- Quick Start Guide

EE2CL-2KT

- 3 x Extended Ethernet units
- 1 x 48Vdc, 1.25A PoE Power Supply Unit
- 1 x BNC-T Splitter Adaptor
- Quick Start Guide

EE2CL-3KT

- 4 x Extended Ethernet units
- 1 x 48Vdc, 1.25A PoE Power Supply Unit
- 1 x 1:4 BNC Splitter Adaptor
- Quick Start Guide

EE2CL-4KT

- 5 x Extended Ethernet units
- 1 x 48Vdc, 1.25A PoE Power Supply Unit
- 1 x 1:4 BNC Splitter Adaptor
- Quick Start Guide

The following units are also available as individual units:

EE2CL-1	Extended Ethernet unit
GS60A-48-P1J	48Vdc, 1.25A PoE power supply unit
EE2CL-RK	19" high density rack system
EE-BNC4	1:4 BNC Splitter Adaptor
EE-BNC2	BNC T-Splitter

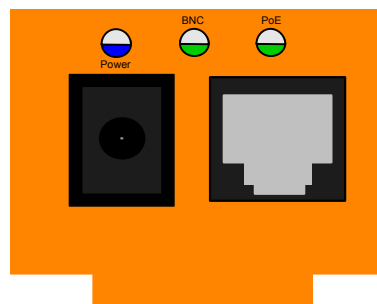
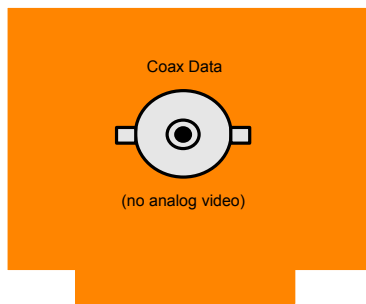
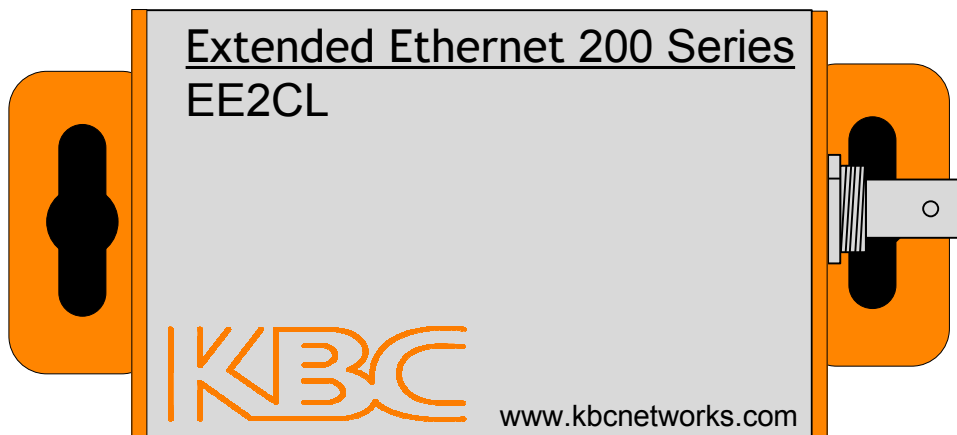
Please contact your dealer or distributor if a part is missing or damaged within 10 days of receiving products.

2.2 Configurations

Products are available in either compact or wall-mount packages, with the following configurations:

Product Type	Compact
EE2CL	✓

2.2.1 Physical Connections



2.3 Installation Method

2.3.1 Compact

Basic configuration

- Remove all the packaging materials and labels.
- Choose a Master EE2CL unit; this can be any of the units purchased.
- Connect the 48Vdc power supply to the Master EE2CL unit.
- Check that the blue LEDs on both EE2CL units are lit.

Connecting the EE2CL to the camera

- Mount the EE2CL near to the IP camera.
- Connect an RJ45 cable between the camera and the RJ45 connector on the EE2CL unit.
- Connect the coaxial cable to the BNC connector on the EE2CL unit.
- If multiple camera units connect to a single Master unit then the 1:4 BNC Splitter Adaptor or BNC-T adapter will be required.

Note: Depending on power requirements and cable distances power for both the Master and Slave EE2CL units and the IP cameras can be supplied from the PSU located at the Master EE2CL unit. For high power or long distance systems, multiple PSU units will be required; see Section 2.6.

Connecting the Master EE2CL unit at the Control Room

- Mount the Master EE2CL unit in the Control Room.
- Connect the coaxial cable to the BNC connector on the EE2CL unit.
- Connect the supplied 48Vdc PSU to the EE2CL unit
- Connect the RJ45 cable from the EE2CL unit to the Control Room equipment.
- The green LEDs will light when a network link is established and flash to show when data traffic is being passed.

See section 2.7 for LED status.

Note: If two or more Master EE2CL units are connected to the same switch within a network, the units will need to be 'joined' to each other. You will need a small paper-clip partially straightened to join EE2CL units; this is provided with the unit.

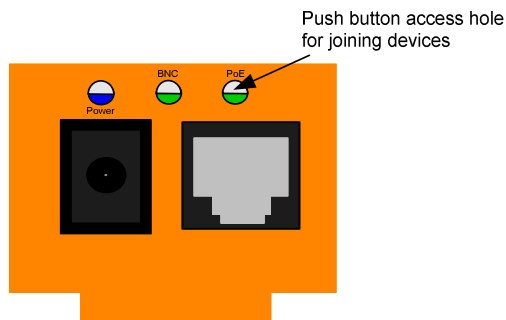


Joining EE2CL units

- Remove all the packaging materials and labels.
- Choose an EE2CL unit (unit 'A'); this can be any of the units purchased.
- Using a coaxial jumper lead, connect the chosen EE2CL unit (unit 'A') to one of the other units (unit 'B') by attaching one EE2CL unit to each end of the coaxial cable.
- Connect the 48Vdc power supply to the EE2CL unit 'A'.
- Check that the blue LEDs on both EE2CL units are lit.
- Wait 20 seconds. Check that the green BNC LEDs on both EE2CL are 'off'.

Note: If either of the green BNC LEDs remains 'on' then that unit has already been 'joined' to another EE2CL unit in a different group and will need to be 'un-joined' before being 'joined' to the new unit. See the 'un-joining' instructions below.

- On the EE2CL unit 'A' (which is connected to the PSU) use the straightened paper-clip to depress the push button for 2 seconds. This button can be found slightly above the PoE LED.



- The blue Power LED will flash.
- Depress the same push-button on the EE2CL unit 'B' for 2 seconds.
- Wait for 10 seconds. The two units will now try to establish an encrypted communication.
- Once the blue Power LEDs return to a steady condition the units have been joined.
- If more EE2CL units need to be 'joined', disconnect EE2CL unit 'B' from EE2CL unit 'A'. Connect the new 'un-joined' EE2CL unit 'C' to EE2CL unit 'A'.
- Repeat the joining instructions until all units in the group are 'joined' to the EE2CL unit 'A'.

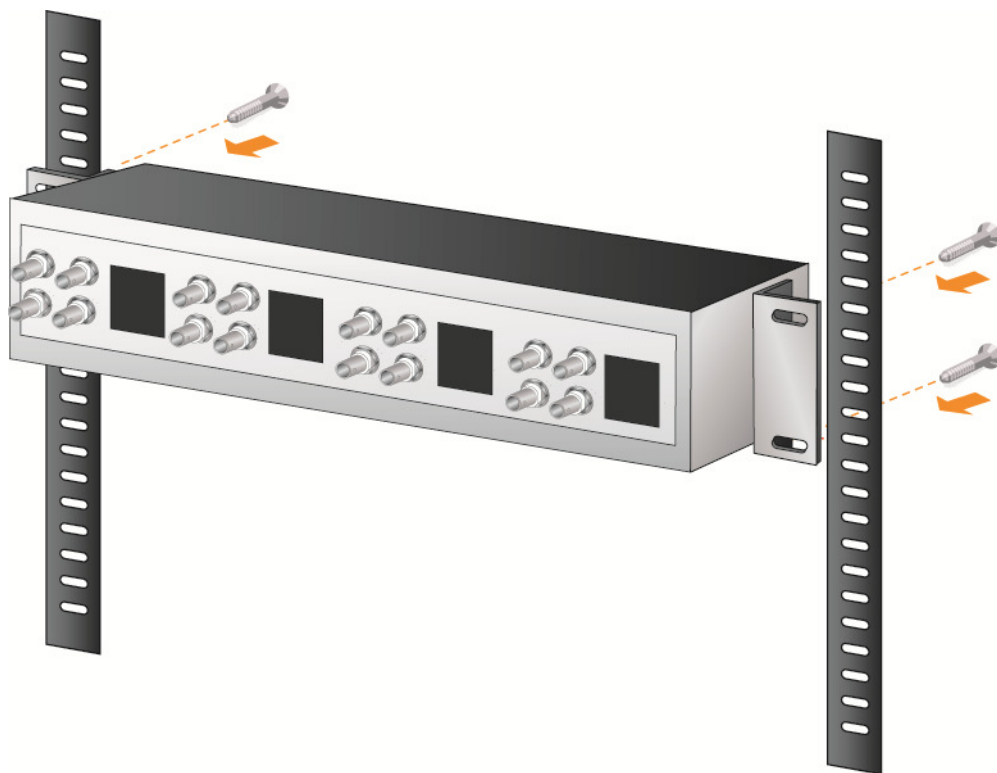
Un-joining EE2CL units

- Disconnect the EE2CL unit from the old network.
- Connect a 48vdc PSU to the unit.
- Wait until the green BNC LED lights.
- Using the straightened paper-clip press the small push-button located behind and slightly above the RJ45 LED.
- Wait until the blue LED turns off.
- Release the paper-clip.
- The green BNC and RJ45 LEDs will flash and then turn off.
- The green BNC LED will then switch on for 10 seconds and then switch off.
- The units are now un-joined.

2.3.2 Rack-mount

- Remove all packaging material.
- For each of the 1:4 BNC Splitter Adaptors, push the BNC connectors through the holes in the front panel of the rack and secure into place. Ensure that the BNC connectors are properly positioned so that they do not have contact with the metal rack, before clamping into place.
- Position the PSUs into the internal PSU brackets, they do not need to be secured in place, ensure that the slot in the front is lined up with the PSU mains pins.
- Position the EE2CL units into the internal brackets and secure with the nuts and bolts provided with the rack.
- Attach the 1:4 BNC Splitter Adaptor to the connector on the EE2CL unit.
- Connect the kettle lead through the front panel into the PSUs.
- Switch the power on.

See section 2.7 for LED status.



2.4 Coaxial Cable Connection

Connect the unit’s BNC socket to the coaxial cable. When a physical link over coaxial cable is established and the units are powered up, the green BNC LED will light to show that the unit has detected another unit and then flash to indicate there is link activity. See section 2.7 for complete details of LED status.

2.5 Ethernet Cable Connection

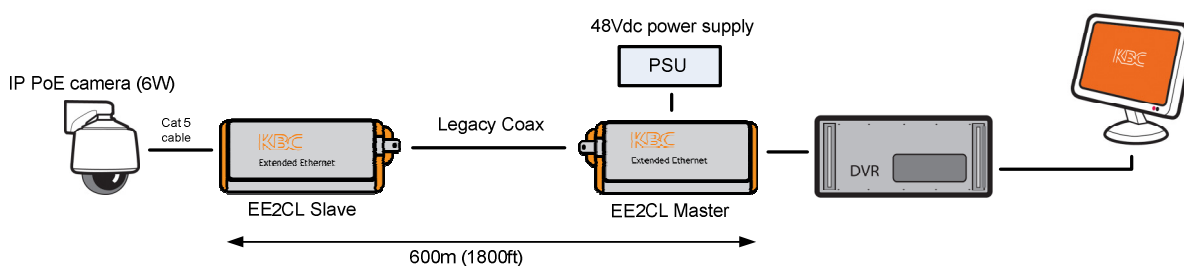
The RJ45 port is adaptive and supports auto MDI/MDI-X connection. It can be connected by straight through or cross-over type Cat5 or Cat 6 cables. The green RJ45 LED will light to indicate a link connection and flash to show when data traffic is being passed. See section 2.7 for complete details of LED status.

2.6 Power Connections

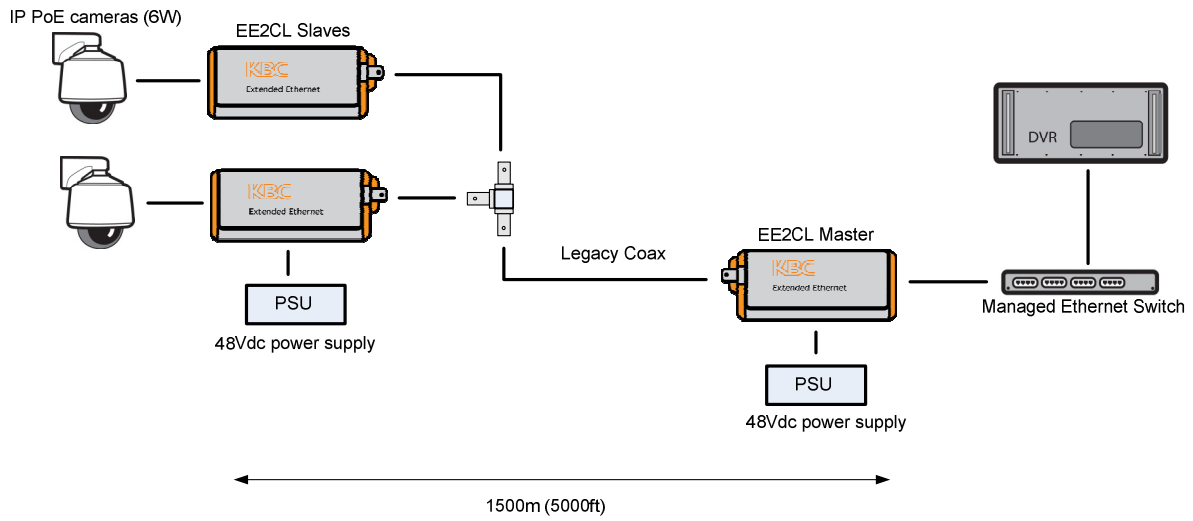
This EE2CL unit must be powered by the +48Vdc, 1.25A PoE power supply, this is supplied with the unit and is connected using a 2.1mm barrel connector.

Note: For higher power or longer distance applications please contact KBC Networks.









Depending on power requirements and cable distances, power for both the Master and Slave EE2CL units and the IP cameras can be supplied from the PSU located at the Master EE2CL unit.



For long distance systems up to two PSU units can be used as shown below:



2.7 LED Status

LED	Status	Description
Power	 ON	Power is supplied to the unit
	 OFF	No power to the unit
BNC	 ON	Another EE2CL unit has been detected
	 FLASH	Link activity
	 OFF	No link established
PoE	 ON	Link active
	 FLASH	Ethernet activity and joining function
	 OFF	No link established

3 Troubleshooting

When the device is powered on, the blue Power LEDs will light to indicate the presence of power. If the power LEDs flash then the power supply is cycling on and off due to overload conditions please check to see whether there are any of the following:

- Wiring faults
- Excessive loading

If the BNC LED does not light after a wire is connected between two EE2CL units please check the following:

- Verify that the cable connecting the two units is not greater than 1500m in length

If the PoE LED does not light after a cable is connected to the port please check the following:

- Verify that the cable being used is Cat5, 5e or 6
- Check that the power to both the EE2CL and the connected device are switched on
- Check that all cables are firmly seated
- Check that the power adaptors are all functioning

If there is no video being passed through the system, please check that you are using a managed Ethernet switch. The EE2CL unit will block unknown multicast packets and hence the video will be blocked. IGMP is required for a properly configured multi-cast network.

4 System Example

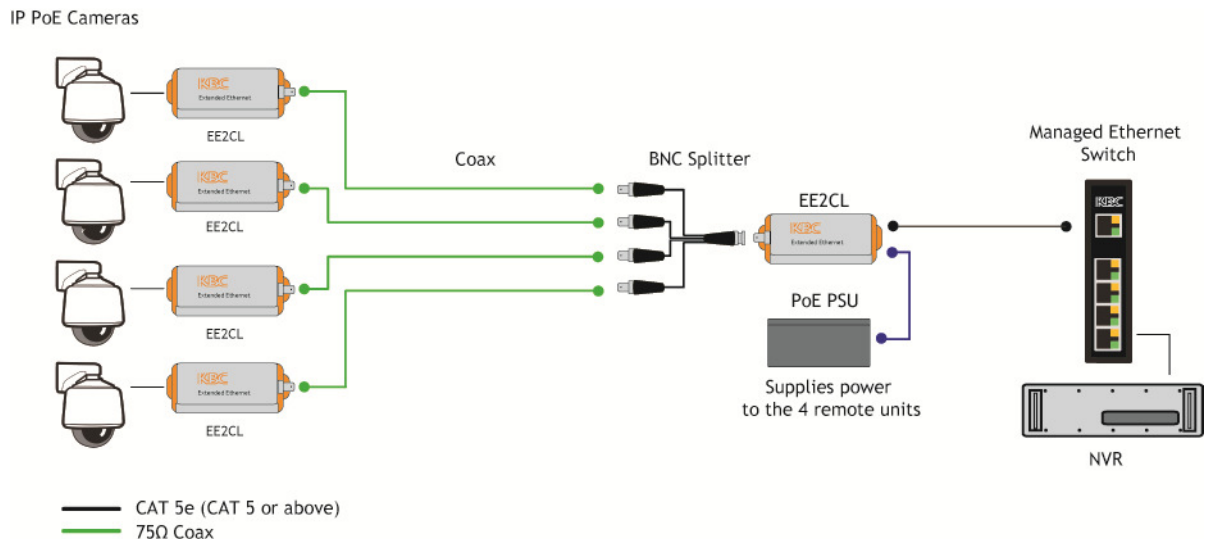
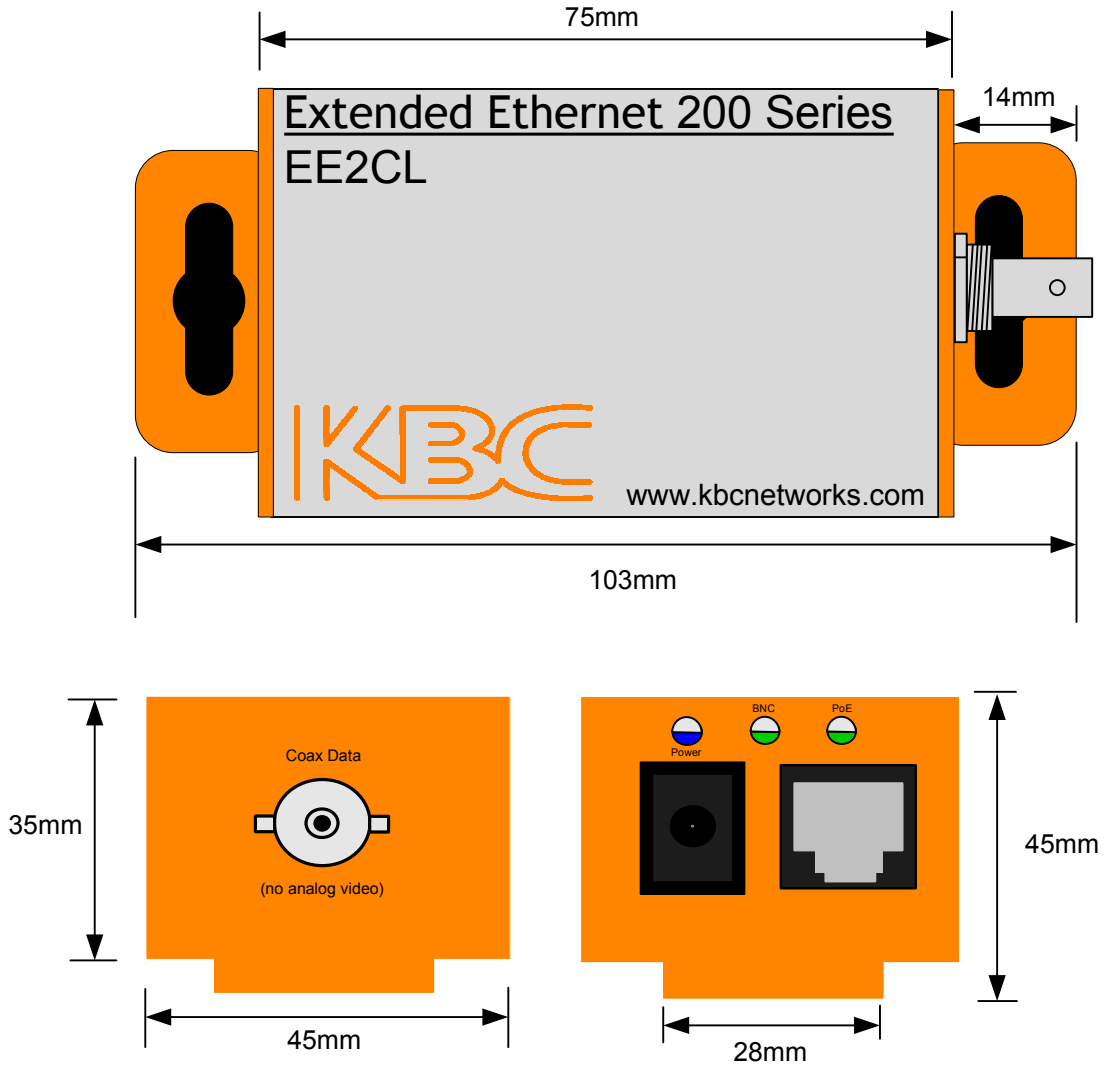


Figure 4.1 EE2CL Typical System Application

5 Dimensions



6 Warranty

6.1 Warranty Information

KBC extends the following LIMITED WARRANTY to the original owner/purchaser of this product as follows:

- Five years from the date of initial sale for Ethernet switches & Extended Ethernet products.
 - Two years from the date of initial sale for all wireless and other network products.
 - Five years from the date of initial sale for all fiber products.
- 1) If, within the specified warranty period, this product, or any part or portion thereof, shall prove upon examination by KBC, to be defective in material or workmanship, KBC will repair or replace such part or portion at KBC's option. The warranty period on the repaired or replaced part or portion of this product shall be limited to the unexpired term of the original warranty. The buyer shall be responsible for all shipping and transportation of the product to KBC for any performance under this warranty.
 - 2) Conditions and Exceptions:
 - a) Any accident to this product, any misuse or abuse, alternation, use in modified form, or any attempt to repair this product shall void this warranty. These conditions to the warranty include, but are not limited to, incorrect power connections, physical damage due to mechanical shock, exposure to moisture, and circuit modification.
 - b) SHOULD THIS PRODUCT PROVE DEFECTIVE FOLLOWING PURCHASE, THE BUYER, NOT THE MANUFACTURER, DISTRIBUTOR, OR RETAILER, ASSUMES THE ENTIRE COST OF ALL SERVICING OR REPAIR, EXCEPT AS OTHERWISE PROVIDED BY THE TERMS OF THIS WARRANTY.
 - c) FOR BREACH OF ANY WRITTEN OR IMPLIED WARRANTY ON THIS PRODUCT, THE BUYER IS LIMITED TO THE FOLLOWING DAMAGES. (1) THE COST OF LABOR TO REPAIR OR REPLACE DEFECTIVE PARTS OR PORTIONS OF THIS PRODUCT, AND (2) THE COST OF THE REPAIRED OR REPLACE PARTS OR PORTIONS OF THIS PRODUCT.
 - d) NO OTHER EXPRESSED OR IMPLIED WARRANTIES HAVE BEEN MADE OR WILL BE MADE ON BEHALF OF KBC WITH RESPECT TO THE SALE, REPAIR, INSTALLATION, OPERATION, OR REPLACEMENT OF THIS PRODUCT. KBC DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OF THIS PRODUCT OR ITS FITNESS FOR ANY PURPOSE, AND THE BUYER AGREES THAT THIS PRODUCT IS SOLD "AS IS" AND THAT THE ENTIRE RISK OF QUALITY AND PERFORMANCE OF THIS PRODUCT IS WITH THE BUYER, EXCEPT AS OTHERWISE PROVIDED BY THE TERMS OF THIS WARRANTY.
 - e) Some states/jurisdictions do not allow exclusions or limitations of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions or limitations may not apply to you.
 - f) If you do not wish to be bound by any of the provisions in this warranty, please return the product(s) immediately.
 - 3) Contact your dealer regarding return authorizations for out of warranty repairs and any further product information.

This warranty does not apply in Australia.

6.2 Class A ITE

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

6.3 FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful Interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at this own expense.

7 Instruction of Disassembly

Instruction of Disassembly of KBC Product (For EU Directive 2002/95/EEC-WEEE)

Tools required:

- No. 1 Phillips screwdriver
- No. 2 Phillips screwdriver

Steps for disassembly:

1. Remove tightening screws of box cover.
2. Remove cover plate.
3. Remove tightening screws for printed circuit board (PCB).
4. Take out all PCBs.

Notice: When a product reaches the end of its life – return to KBC.



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