

Echo™



**Wireless • Batteryless • Self-powered
Switches and Controls**



range introduction

Imagine switch technology and automated systems that need no wiring, use no batteries and are effortless to install and commission. Echo™ is an innovative range of entirely wireless, batteryless and self-powered switches and controls which can work together offering even more convenience and energy saving opportunities.

Echo™ enables you to create your own automated control system for a domestic or commercial environment. With the ability to incorporate a range of transmitters from switches, temperature sensors and presence detectors, alongside a range of receivers, the installer can create a flexible system which can deliver safety, comfort, cost savings and energy efficiency for the building owner or user.

The MK Echo™ portfolio is enabled by EnOcean technology. EnOcean based products make use of the energy generated by slight changes in pressure, light levels or temperature, to provide self-powered, batteryless and wireless solutions. This technology is used by many world leading manufacturers, products from these companies can be used together to provide solutions for energy efficient buildings which are more flexible and cost efficient to design, build and operate.

To find out more visit www.mkelectric.co.uk.

technical hotline +44 (0)1268 563720

wireless | wiring devices



features and benefits

Wireless

Instant installation and location flexibility, reducing disruption and cost.

Batteryless

Low maintenance and low running costs makes Echo™ a very versatile and sustainable option.

Self-powered

Uses innovative technology to 'harvest' energy.

Automated systems

Gives the user control over their local environment ensuring maximum comfort and convenience.

Energy savings

With additional local control, alongside the use of temperature sensors and presence detectors, users can create an energy efficient environment.

Be it a functional building, office, home or hotel suite, Echo™ is the future of switch technology and automation systems.



WIRELESS



BATTERYLESS



SELF-POWERED

Application Example: Hotel Bedroom

In this example the installer is able to create an automated system to enable the control of lights, curtains and temperature to ensure comfort for the guest, whilst delivering energy efficiency and cost savings for the hotel without disturbing the fabric of the room. In addition, with wireless transmitters, the layout and positioning is completely flexible and can be changed quickly without disruption.

The guest is able to easily control their local environment from a number of locations within the room. A 2 channel transmitter by the entry doorway enables control of both the bedroom and living area lighting. An additional 4 channel transmitter next to the bed gives further control of not only the bedroom and living area lighting, but also the curtains and an all off function. There is additional control in the bathroom and on the balcony.

The hotel is able to control all lighting, heating and cooling by the card switch transmitter, ensuring guests do not leave lighting or air conditioning on when they leave the room. The hotel is also able to ensure a safe environment; the presence detector can be programmed to turn low level lighting on when a guest enters the room during the hours of darkness. In addition the presence detector can be programmed to turn lighting off, or dim to a low level when no presence is detected in the room but the card switch is still in place. Door contacts ensure the air conditioning is not in use whilst the balcony doors are open, offering further energy savings. The temperature sensor can also help control energy costs; in a cold environment a reduction in temperature by just two degrees during the hours of sleep can have a big impact on the overall energy bill.

The KNX gateway enables each Echo-controlled hotel room to be linked to a central computer, where a facilities manager can remotely monitor and control each hotel room, and the overall system.

To find out more visit www.mkelectric.co.uk.



SWITCH RECEIVER



MOTOR CONTROLLER



PLUG-THROUGH DIMMER RECEIVER



4 CHANNEL TRANSMITTER

- 1 - LIVING AREA LIGHTS
- 2 - BEDROOM LIGHTS
- 3 - PLUG-THROUGH LIGHT
- 4 - ALL OFF



1 CHANNEL TRANSMITTER



SWITCH RECEIVER

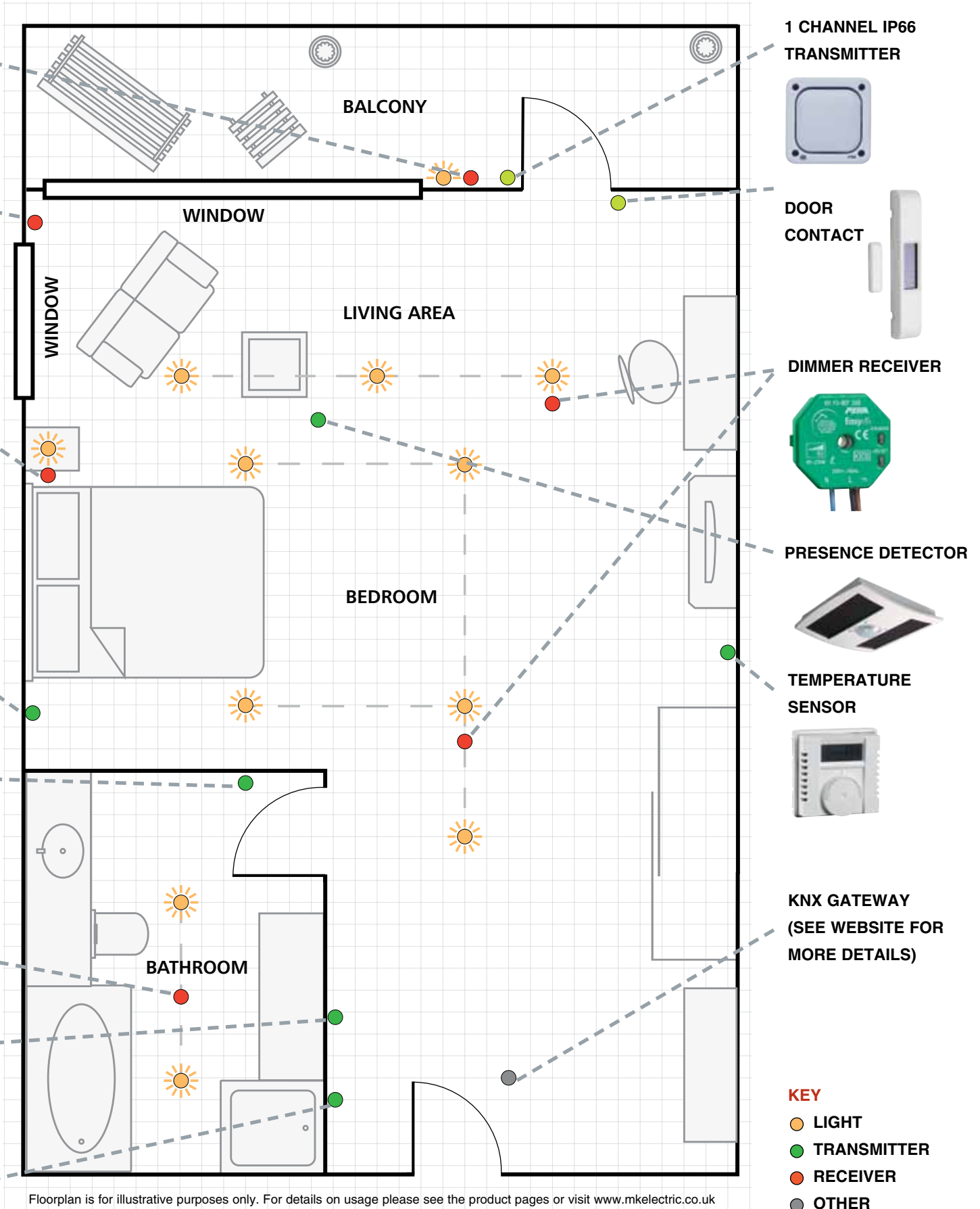


2 CHANNEL TRANSMITTER

- 1 - BEDROOM LIGHTS
- 2 - LIVING AREA



CARD TRANSMITTER



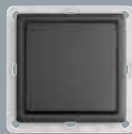
Modular Transmitters

1 CHANNEL
MODULAR
TRANSMITTER

2 CHANNEL
MODULAR
TRANSMITTER

MODULAR
CARD SWITCH
TRANSMITTER

MODULAR
WALL
TEMPERATURE
SENSOR
TRANSMITTER



FINISHES

WHITE	K5786WHI 1	K5789WHI 1	K5744CWHI 1	K5744WHI 1
BLACK	K5786BLK 1	K5789BLK 1	K5744CBLK 1	K5744BLK 1
ALUMINIUM	K5786ALU 1	K5789ALU 1	K5744CALU 1	K5744ALU 1

ONLY COMPATIBLE WITH THE
K5422G KNX GATEWAY OR A
DEDICATED SEPARATE RECEIVER.
SEE WEBSITE FOR DETAILS.

For use with K5776, K5779 frames
and K5412 locator

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and K5412 locator

For use with K5776, K5779 frames
and K5412 locator.

OPERATING FREQUENCY:
868.3Mhz
IP RATING:
IP2 x D
DIMENSIONS:
55 x 55mm
ETSI EN 301489-1/3
ETSI EN 300220-1/2

OPERATING FREQUENCY:
868.3Mhz
IP RATING:
IP2 x D
DIMENSIONS: 55 x 55mm
ETSI EN 301489-1/3
ETSI EN 300220-1/2

OPERATING FREQUENCY:
868.3Mhz
IP RATING:
IP2 x D
DIMENSIONS:
55 x 55mm
ETSI EN 301489-1/3
ETSI EN 300220-1/2

OPERATING FREQUENCY:
868.3Mhz
IP RATING:
IP2 x D
DIMENSIONS:
55 x 55mm
ETSI EN 301489-1/3
ETSI EN 300220-1/2

MOUNTING SWITCH TRANSMITTERS: All can be mounted directly to the wall surface – screws supplied. All can be mounted to back boxes – screws supplied.
Logic Plus and Aspect type transmitters can also be mounted using supplied adhesive pads

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wireless | wiring devices

Modular Frames

1G FRAME
GLOSSY
FINISH

2G FRAME
GLOSSY
FINISH

1G FRAME
GLASS
FINISH

2G FRAME
GLASS
FINISH



FINISHES

WHITE

K5776WHI
1

K5779WHI

1

BLACK

K5776BLK
1

K5779BLK

1

ALUMINIUM

K5776ALU
1

K5779ALU

1

FINISHES

GLASS, BLACK

K5776GLAB

1

K5779GLAB

1

GLASS, GREEN

K5776GLAG

1

K5779GLAG

1

**GLASS,
ALUMINIUM**

K5776GLAA

1

K5779GLAA

1

**GLASS, GROOVED
ALUMINIUM**

K5776GLAGA

1

K5779GLAGA

1

For use with K5412 locator and K5786, K5789, K5744, K5744C transmitters.
Surface mount installation only.

DIMENSIONS:
83 x 83mm

For use with K5412 locator and K5786, K5789, K5744, K5744C transmitters.
Surface mount installation only.

DIMENSIONS:
83 x 154mm

For use with K5412 locator and K5786, K5789, K5744, K5744C transmitters.
Surface mount installation only.

DIMENSIONS:
85 x 85mm

For use with K5412 locator and K5786, K5789, K5744, K5744C transmitters.
Surface mount installation only.

DIMENSIONS:
85 x 157mm

MOUNTING SWITCH TRANSMITTERS: All can be mounted directly to the wall surface – screws supplied. All can be mounted to back boxes – screws supplied. Logic Plus and Aspect type transmitters can also be mounted using supplied adhesive pads

TRANSMITTERS

Logic Plus

1 CHANNEL
TRANSMITTER2 CHANNEL
TRANSMITTER

FINISHES

WHITE	K4786WHI 1	K4789WHI 1
GRAPHITE	K4786GRA 1	K4789GRA 1

OPERATING FREQUENCY:
868.3MhzIP RATING:
IP2 x DDIMENSIONS:
86 x 86mmBS EN 60669-1 ;
BS EN 60669-2-1 ;
ETSI EN 301 489-1 + -3 ;
ESTI EN 300 220-3OPERATING FREQUENCY:
868.3MhzIP RATING:
IP2 x DDIMENSIONS:
86 x 86mmBS EN 60669-1 ;
BS EN 60669-2-1 ;
ETSI EN 301 489-1 + -3 ;
ESTI EN 300 220-3

Albany Plus

1 CHANNEL
TRANSMITTER2 CHANNEL
TRANSMITTER

FINISHES

BRUSHED STAINLESS STEEL	K4766BSS* 1	K4767BSS* 1
LACQUERED BRUSHED STEEL		
SILVER ANODIZED ALUMINIUM		
BRUSHED CHROME	K4766BRC* 1	K4766BRC* 1
POLISHED CHROME	K4766PCR* 1	K4766PCR* 1
SATIN GOLD	K4766SAG* 1	K4767SAG* 1
PORCELAIN WHITE		
LUSTROUS IVORY		
LUSTROUS BLACK		
POLISHED BRASS		
TEXTURED IRON		
DESERT BRONZE		
ANTIQUE BRASS		
TEXTURED COPPER		

* Available with the option of either White or Black inserts. Add Suffix 'W' or 'B' to part number when ordering, E.g. KxxxxBSSW.

Where there is no asterisk, the final suffix W = White Insert, B = Black Insert, E.g. KxxxxWHIW = Porcelain White finish with White inserts

LEAD TIMES: Please
contact our Customer
Services Department
on: 01268 563 404

OPERATING FREQUENCY:
868.3MhzIP RATING:
IP2 x DDIMENSIONS:
86 x 86mmBS EN 60669-1 ;
BS EN 60669-2-1 ;
ETSI EN 301 489-1 + -3 ;
ESTI EN 300 220-3OPERATING FREQUENCY:
868.3MhzIP RATING:
IP2 x DDIMENSIONS:
86 x 86mmBS EN 60669-1 ;
BS EN 60669-2-1 ;
ETSI EN 301 489-1 + -3 ;
ESTI EN 300 220-3

MOUNTING SWITCH TRANSMITTERS: All can be mounted directly to the wall surface – screws supplied. All can be mounted to back boxes – screws supplied.
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Aspect





1 CHANNEL
TRANSMITTER

2 CHANNEL
TRANSMITTER

Edge

1 CHANNEL
TRANSMITTER

2 CHANNEL
TRANSMITTER

			
K23476BSS*	K23477BSS*	K13476BSS*	K13477BSS*
K23476LBS*	K23477LBS*	K13476LBS*	K13477LBS*
		K13476SAA*	K13477SAA*
K23476BRC*	K23477BRC*	K13476BRC*	K13477BRC*
K23476POC*	K23477POC*	K13476POC*	K13477POC*
K23476SAG*	K23477SAG*	K13476SAG*	K13477SAG*
K23476WHIW	K23477WHIW	K13476WHIW	K13477WHIW
K23476LIVW	K23477LIVW	K13476LIVW	K13477LIVW
K23476LBKB	K23477LBKB	K13476LBKB	K13477LBKB
K23476PBR*	K23477PBR*	K13476PBR*	K13477PBR*
K23476TIRB	K23477TIRB	K13476TIRB	K13477TIRB
K23476DBZB	K23477DBZB	K13476DBZB	K13477DBZB
K23476ABSB	K23477ABSB	K13476ABSB	K13477ABSB
K23476TCOB	K23477TCOB	K13476TCOB	K13477TCOB

* Available with the option of either White or Black inserts. Add Suffix 'W' or 'B' to part number when ordering, E.g. KxxxxBSSW.

Where there is no asterix, the final suffix W = White Insert, B = Black Insert, E.g. KxxxxWHIW = Porcelain White finish with White inserts

OPERATING FREQUENCY:
868.3 Mhz

IP RATING:
IP2 x D

DIMENSIONS:
86 x 86mm

BS EN 60669-1 ;
BS EN 60669-2-1 ;
ETSI EN 301 489-1 + -3 ;
ESTI EN 300 220-3

OPERATING FREQUENCY:
868.3 Mhz

IP RATING:
IP2 x D

DIMENSIONS:
86 x 86mm

BS EN 60669-1 ;
BS EN 60669-2-1 ;
ETSI EN 301 489-1 + -3 ;
ESTI EN 300 220-3

OPERATING FREQUENCY:
868.3 Mhz

IP RATING:
IP2 x D

DIMENSIONS:
86 x 86mm

BS EN 60669-1 ;
BS EN 60669-2-1 ;
ETSI EN 301 489-1 + -3 ;
ESTI EN 300 220-3

OPERATING FREQUENCY:
868.3 Mhz

IP RATING:
IP2 x D

DIMENSIONS:
86 x 86mm

BS EN 60669-1 ;
BS EN 60669-2-1 ;
ETSI EN 301 489-1 + -3 ;
ESTI EN 300 220-3

MOUNTING SWITCH TRANSMITTERS: All can be mounted directly to the wall surface – screws supplied. All can be mounted to back boxes – screws supplied. Logic Plus and Aspect type transmitters can also be mounted using supplied adhesive pads

TRANSMITTERS

Metalclad Plus

Masterseal Plus

Other

Presence Detector

1 CHANNEL
TRANSMITTER

2 CHANNEL
TRANSMITTER

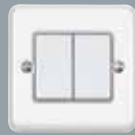
1 CHANNEL
TRANSMITTER

2 CHANNEL
TRANSMITTER

REMOTE
CONTROL
TRANSMITTER

WINDOW
CONTACT
TRANSMITTER

SENSOLUX
SOLAR-
PRESENCE
DETECTOR



FINISHES

ALUMINIUM	K3786ALM 1	K3787ALM 1			K5417R 1	K5421 1	K5754 1
GREY			K55400GRY 1	K55406GRY 1			ONLY COMPATIBLE WITH THE K5435R RECEIVER OR THE K5422G KNX GATEWAY. SEE WEBSITE FOR DETAILS.
WHITE	K3786WHI 1	K3787WHI 1	K55400WHI 1	K55406WHI 1			
BLACK			K55400BLK 1	K55406BLK 1			

Provides interlock functionality for use with multi-function receivers and blind controllers.
Solar powered.

Solar powered with optional backup battery.

OPERATING FREQUENCY: 868.3 Mhz
IP RATING: IP2 x D
DIMENSIONS: 86 x 86mm
BS EN 60669-1 ; BS EN 60669-2-1 ; ETSI EN 301 489-1 + -3 ; ESTI EN 300 220-3

OPERATING FREQUENCY: 868.3 Mhz
IP RATING: IP2 x D
DIMENSIONS: 86 x 86mm
BS EN 60669-1 ; BS EN 60669-2-1 ; ETSI EN 301 489-1 + -3 ; ESTI EN 300 220-3

OPERATING FREQUENCY: 868.3 Mhz
IP RATING: IP66
DIMENSIONS: 95 x 95 x 57mm
BS EN 60669-1 ; BS EN 60669-2-1 ; ETSI EN 301 489-1 + -3 ; ESTI EN 300 220-3

OPERATING FREQUENCY: 868.3 Mhz
IP RATING: IP66
DIMENSIONS: 95 x 95 x 57mm
BS EN 60669-1 ; BS EN 60669-2-1 ; ETSI EN 301 489-1 + -3 ; ESTI EN 300 220-3

OPERATING FREQUENCY: 868.3 Mhz
IP RATING: IP2 x D
DIMENSIONS: 50 x 82 x 21mm
BS EN 60669-1 ; BS EN 60669-2-1 ; ETSI EN 301 489-1 + -3 ; ESTI EN 300 220-3

OPERATING FREQUENCY: 868.3Mhz
IP RATING: IP40
DIMENSIONS: 110 x 19 x 15mm and 23 x 14 x 6mm
EN 301489-1/3
EN 300220-1/2

OPERATING FREQUENCY: 868.3Mhz
IP RATING: IP50
DIMENSIONS: 108 x 108 x 26.8mm
EN 301489-1/3
EN 300220-1/2

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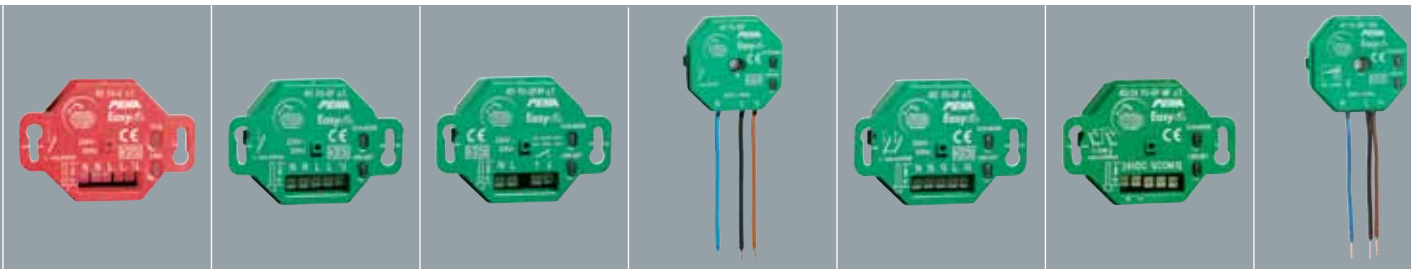
wireless | wiring devices

RECEIVERS

1 Channel Switch Receivers

2 Channel Switch Receivers

1 Channel Dimmer Receiver



K5434R 1 CHANNEL SWITCH RECEIVER

K5432R 1 CHANNEL MULTI-FUNCTION SWITCH RECEIVER

K5431R 1 CHANNEL VOLT-FREE, MULTI-FUNCTION SWITCH RECEIVER

K5437R 1 CHANNEL MULTI-FUNCTIONAL SWITCH RECEIVER LEADED

K5433R 2 CHANNEL MULTI-FUNCTION SWITCH RECEIVER

K5430R 2 CHANNEL 24VDC MULTI-FUNCTION SWITCH RECEIVER

K5436R 1 CHANNEL MULTI-FUNCTIONAL DIMMER RECEIVER LEADED

Provides basic on/off functionality only.

SUPPLY:
230V / 50Hz

LOAD RATINGS:
GLS/Incandescent: 2500W
Halogen: 1200W
Inductive: 600VA
Electronic Ballasts: 3 units

Operating Frequency:
868.3MHz

DIMENSIONS:
Depth: 27mm

EN 60669-2-1
EN 301489-1/3
EN 300220-1/2

Multi-functional device providing: single button, stairwell, time-delay, fan, scene operating modes and interlock functions for use with window contact.

SUPPLY:
230V / 50Hz

LOAD RATINGS:
GLS/Incandescent: 2500W
Halogen: 1200W
Inductive: 600VA
Electronic Ballasts: 3 units

Operating Frequency:
868.3MHz

DIMENSIONS:
Depth: 27mm

EN 60669-2-1
EN 301489-1/3
EN 300220-1/2

Multi-functional device providing: single button, stairwell, time-delay, fan, scene operating modes and interlock functions for use with window contact.

SUPPLY:
230V / 50Hz

LOAD RATINGS:
GLS/Incandescent:
1200W @ 230Vac
50W @ 30Vdc
Halogen: 600W @ 230Vac

Operating Frequency:
868.3MHz

DIMENSIONS:
Depth: 27mm

EN 60669-2-1
EN 301489-1/3
EN 300220-1/2

Multi-functional device providing: single button, stairwell, time-delay, fan, scene operating modes and interlock functions for use with window contact.

SUPPLY:
230V / 50Hz

LOAD RATINGS:
GLS/Incandescent: 2500W
Halogen: 1200W
Inductive: 600VA
Electronic Ballasts: 3 units

Operating Frequency:
868.3MHz

DIMENSIONS:
Depth: 27mm

EN 60669-2-1
EN 301489-1/3
EN 300220-1/2

Multi-functional device providing: single button, stairwell, time-delay, fan, scene operating modes and interlock functions for use with window contact.

SUPPLY:
230V / 50Hz

LOAD RATINGS (per channel):
GLS/Incandescent: 500W
Halogen: 100W
Inductive: 100VA
Electronic Ballasts: 1 unit

Operating Frequency:
868.3MHz

DIMENSIONS:
Depth: 27mm

EN 60669-2-1
EN 301489-1/3
EN 300220-1/2

Multi-functional device providing single button, pulsed and time-delay operating modes

SUPPLY:
24Vdc

LOAD RATINGS (per channel):
300mA @ 24Vdc
Operating Frequency:
868.3MHz

DIMENSIONS:
Depth: 27mm

EN 60669-2-1
EN 301489-1/3
EN 300220-1/2

Multi-functional device providing: soft start, turn-on memory, switch, stairwell and scene operating modes.

SUPPLY:
230V / 50Hz

LOAD RATINGS:
60-210W

Suitable for use with GLS/Incandescent/Halogen lamps and 12V low voltage lighting powered by dimmable electronic transformers only.

Operating Frequency:
868.3MHz

DIMENSIONS:
Depth: 27mm

EN 60669-2-1
EN 301489-1/3
EN 300220-1/2

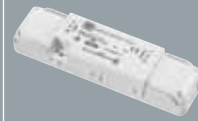
MOUNTING SWITCH TRANSMITTERS: All can be mounted directly to the wall surface – screws supplied. All can be mounted to back boxes – screws supplied. Logic Plus and Aspect type transmitters can also be mounted using supplied adhesive pads

RECEIVERS

Plug-Through Receiver

Alternative Receivers

Presence Detector Receiver



K5427S
PLUG-THROUGH
SWITCH



K5428D
PLUG-THROUGH
DIMMER



K5438R
DC MOTOR
CONTROLLER



K5439R
AC MOTOR
CONTROLLER



K5418R
SMALL LOAD
SWITCH RECEIVER
400 WATT



K5420R
10AX SWITCH
RECEIVER/REPEATER



K5435R
SENSOLUX
1 CHANNEL ENERGY
CONTROLLER RECEIVER

Multi-functional device providing: single button, stairwell, time-delay, fan, scene operating modes and interlock functions for use with window contact.

SUPPLY:
230V / 50Hz

LOAD RATINGS:
GLS/Incandescent: 2500W
Halogen: 1250W
Inductive: 600VA
Electronic Ballasts: 3 units

Operating Frequency:
868.3MHz

DIMENSIONS:
130 x 68 x 48mm

EN 60669-2-1
EN 301489-1/3
EN 300220-1/2

Multi-functional device providing: soft start, turn-on memory, switch, stairwell and scene operating mode.

SUPPLY:
230V / 50Hz

LOAD RATINGS:
60-420W

Suitable for use with GLS/Incandescent/Halogen lamps and 12V low voltage lighting powered by dimmable electronic transformers only

Operating Frequency:
868.3MHz

DIMENSIONS:
130 x 68 x 48mm

EN 60669-2-1
EN 301489-1/3
EN 300220-1/2

Multi-functional device providing: blind control, scene and interlock functions for use with window contact.

SUPPLY:
24Vdc

LOAD RATINGS:
1A

Operating Frequency:
868.3MHz

DIMENSIONS:
Depth: 27mm

EN 60669-2-1
EN 301489-1/3
EN 300220-1/2

Multi-functional device providing: blind control, scene and interlock functions for use with window contact.

SUPPLY:
230V / 50Hz

LOAD RATINGS:
600VA

Operating Frequency:
868.3MHz

DIMENSIONS:
Depth: 27mm

EN 60669-2-1
EN 301489-1/3
EN 300220-1/2

OPERATING
FREQUENCY:
868.3MHz

IP RATING: IP2 x D

DIMENSIONS:
47.4 x 34.6 x 28.9mm

BSEN 60669-1 ;
BS EN 60669-2-1 ;
ETSI EN 301 489-1 + -3 ;
ESTI EN 300 220-3

OPERATING
FREQUENCY:
868.3MHz

IP RATING: IP2 x D

DIMENSIONS:
175.5 x 50.3 x 32.25mm

BSEN 60669-1 ;
BS EN 60669-2-1 ;
ETSI EN 301 489-1 + -3 ;
ESTI EN 300 220-3

For use with K5754 Sensolux Presence detector only

SUPPLY:
230V / 50Hz

LOAD RATINGS:
GLS/Incandescent: 2300W
Halogen: 1250W
Fluorescent Lamps: 1000VA
Inductive: 600VA
Electronic Ballasts: 5 unit

Operating Frequency:
868.3MHz

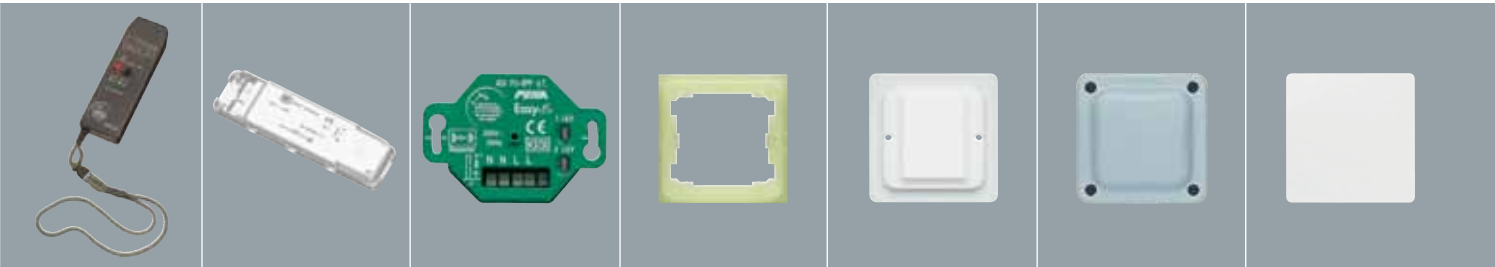
DIMENSIONS:
45 x 38 x 23mm

EN 60669-2-1
EN 301489-1/3
EN 300220-1/2

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Accessories



K541R
FIELD STRENGTH
INDICATOR

1

K5414R
1 LEVEL REPEATER

1

REPEATS SIGNAL ONCE.
WILL NOT REPEAT A
PREVIOUSLY REPEATED
TELEGRAM.

K5440R
2 LEVEL REPEATER

1

WILL REPEAT A
PREVIOUSLY REPEATED
TELEGRAM.

K5412L
LUMINOUS LOCATOR
FRAME FOR USE
WITH MODULAR
TRANSMITTERS

1

K4710P
SURFACE MOUNTED
PATTRESS FOR USE
WITH LOGIC PLUS
TRANSMITTER

1

K5500GRY
K5500WHI
K5500BLK
IP66 ENCLOSURE FOR
USE WITH RECEIVERS,
CHECK INDIVIDUAL
RECEIVER DIMENSIONS

1

KPAD
ADHESIVE PAD FOR
USE WITH LOGIC PLUS
SWITCH TRANSMITTER
AND ASPECT SWITCH
TRANSMITTER

1

Can be operated as either
a level 1 or level 2 repeater
in the system to extend
RF range.

Operating Frequency:
868.3MHz

DIMENSIONS:
Depth: 27mm
EN 60669-2-1
EN 301489-1/3
EN 300220-1/2

MOUNTING SWITCH TRANSMITTERS: All can be mounted directly to the wall surface – screws supplied. All can be mounted to back boxes – screws supplied. Logic Plus and Aspect type transmitters can also be mounted using supplied adhesive pads

Transmitters, Receivers and Accessories

Features

- Wireless and Batteryless – using RF technology with ranges up to 300metres in ideal conditions
- Available in all MK wiring device aesthetics
- Quick and easy to install with no need for cabling from the switch to the lighting circuit
- Robust Metalclad Plus and Masterseal available
- 400w and 10AX receiver/repeaters available to cover most installation needs
- Switch Receivers are capable of switching all lighting types

Description

Echo™ is an innovative range of entirely wireless, batteryless and self powered switches, only available from MK Electric.

Wireless – allows for instant switch installation and location flexibility, reducing disruption and cost.

Batteryless – low maintenance and low running costs makes echo a very versatile and sustainable option.

Self Powered – using innovative technology to 'harvest' energy.

Echo™ Installer Guide

1. INTRODUCTION

The MK Echo™ range of products are different from all other products in MK's Wiring Devices portfolio in so far as the "switches" are RF transmitters which communicate with Switch Receivers. It is the Switch Receivers that actually switch the mains power.

Echo™ Transmitters send an RF signal at 868.3 MHz. The unique feature of these products is that the signal transmission is made without the need for mains power, or batteries.

Compared to installing hard-wired systems, wireless systems are much simpler and provide the flexibility to relocate or add to a system.

A symbol is visible on all Switch Receivers to indicate the position of the antenna. Although not always possible, the best reception will always be achieved if the front face of the Transmitter is directly facing the surface of the Switch Receiver on which the antenna symbol is shown.

Based on the physical principle of the propagation of radio waves, certain basic conditions should be observed. The following simple recommendations are provided to ensure successful installation and reliable operation of a robust radio network.

NOTE: A FIELD STRENGTH TEST MEASUREMENT SHOULD BE CARRIED OUT PRIOR TO EACH INSTALLATION TO ENSURE COMPLETE RELIABILITY.

2. PRINCIPLES OF RADIO SIGNALS IN BUILDINGS

As stated in the introduction, Echo™ Transmitters send wireless transmissions to the echo™ Switch Receivers. The receiver checks the incoming signal for accuracy and uses the data to control outputs. Radio signals are electromagnetic waves; hence the signal becomes weaker the further it travels.

Please note that RF signals also decrease in strength when they pass through certain materials between the transmitted signal and the receiver.

While radio waves can penetrate a wall, they are dampened more than on a direct line-of-sight path. A few examples of different types of wall and the realistic typical reduction in signal strength that can be seen are:

MATERIAL	ATTENUATION
Wood, plaster, uncoated glass, with no metal content	0 – 10%
Brick, pressed board	5 – 35%
Ferro-concrete	10 – 90%
Metal, aluminium lining	90 – 100%

In practice, this means that the material used in a building must be taken into consideration during any assessment for radio coverage.

Here are some typical guideline figures when using Logic Plus style Transmitters with plastic frontplates:

Line-of-sight connections:	typically 30m range in corridors, or up to 100m in halls
Plasterboard walls / dry wood:	typically 30m range, through 5 walls
Brick walls / aerated concrete:	typically 20m range, through 3 walls
Ferro-concrete walls / ceilings:	typically 10m range, through 1 ceiling

All other Transmitters in the range that have metal frontplates, do of course cause a reduction in the signal strength and therefore the transmission distance. Generally, the line of site distance in a hall is reduced from 100m described above for Logic Plus, down to 30m.

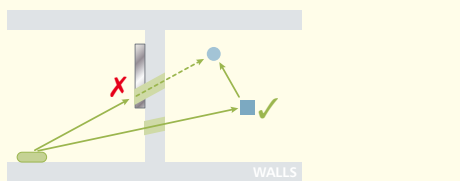
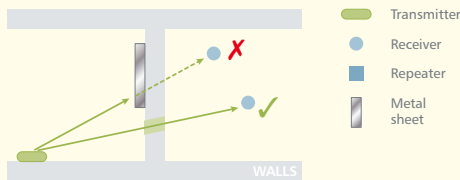
3. SCREENING

Objects made of metal, such as wall reinforcements, the metal foil often used in certain forms of insulation, or metallised heat protected glass, reflect electromagnetic waves and thus create what is known as a radio shadow and thereby a reduction in transmission distance.

The main factors decreasing coverage include:

- A Transmitter mounted on metal surfaces (typically 30% loss of range).
- Transmitters with metal frontplates (typically 60% loss of range).
- Hollow lightweight walls filled with insulating wool on metal foil.
- Inserted ceilings with panels made of metal or carbon fibre.
- Lead glass or glass with metallised coating, steel furniture.

Please note: Fire-safety walls, elevator shafts, staircases and supply areas should be considered as screening.



Simple example of a possible screening problem.

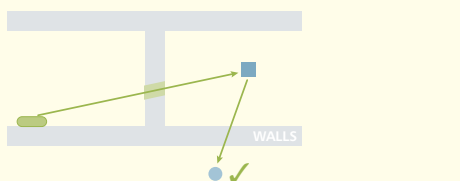
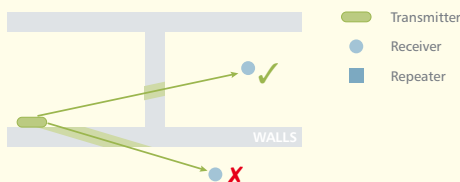
Depending on the material used to build the walls and assuming the distance between the transmitters and receivers are within specification, the illustrations above show a typical screening problem.

For the best range performance a minimum distance of 10mm to 20mm should be allowed from the whole length of the antenna to any conductive objects, which effectively means the area surrounding the Switch Receiver module.

Avoid screening by repositioning the Transmitter and / or Switch Receiver away from the screening objects (radio shadow), or if this is not possible, by using a Repeater.

4. PENETRATION ANGLE

The angle at which the transmitted signal hits the wall is very important. The effective wall thickness – and with it the signal attenuation – varies according to this angle. Signals should be transmitted as directly as possible through the wall. Wall niches should be avoided.

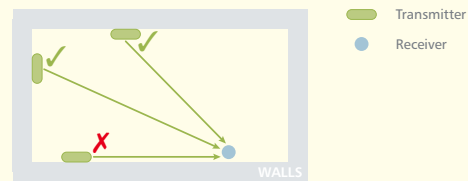


Avoid an unfavourable penetration angle by repositioning the Transmitter and / or Receiver, or by using a Repeater.

Do not position a Switch Receiver behind a Transmitter. In this position the signal strength is greatly reduced, even if there is no wall in-between.

5. ANTENNA INSTALLATION

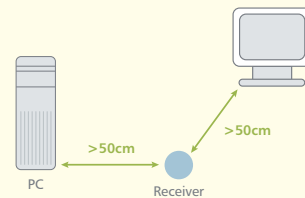
Switch Receivers should not be installed on the same wall as the Transmitter. When positioned near a wall, the radio waves are likely to be subject to interfering dispersions or reflections.



In a similar manner to the comment in the previous section, positioning transmitters and receivers along the same wall will mean the signal strength is greatly reduced.

6. DISTANCE BETWEEN SWITCH RECEIVERS AND A SOURCE OF INTERFERENCE

The distance between Switch Receivers and other transmitters (e.g. GSM / DECT / wireless LAN) or high-frequency sources of interference (computers, audio and video equipment) should be at least 500mm. However, Echo Transmitters can be installed next to any other high-frequency transmitter without a problem.



7. USE OF REPEATERS

In the case of poor reception, it may be helpful to use a Repeater.

The Echo Repeater (K5414R) does not require any configuration (e.g. programming) and will become operational simply by connecting it to the mains supply. The new 10AX Switch Receiver/Repeater (K5420R) is also a repeater when not programmed with any switches. The various possibilities of use are shown by the illustrations in sections 3. SCREENING and 4. PENETRATION ANGLE.

A Repeater has similar requirements in being positioned as a Switch Receiver, i.e. it too has an antenna and needs to receive the signal from the Transmitter and be within range of the Switch Receiver with which it is intended to communicate.

While planning, it may be worth considering retrofitting the system with a Repeater.

Only one repeater is intended for use in any single installation. Using more than one repeater is counterproductive (higher cost, cross-signal interference, etc).

8. FIELD STRENGTH INDICATOR

The K5419R is a mobile Field Strength Indicator enabling the installer to determine the ideal mounting positions for Transmitters and Receivers. Furthermore, faulty connections of devices already installed can be checked. The unit shows the field intensities of radio signals received and any interfering radio signals in the 868MHz range.

Using the Field Strength Indicator allows the installer to review the strength of received signals at the proposed receiver locations – to ensure reliable operation you should aim to have consistent GREEN or AMBER signals on the indicator.

The meaning of the four LEDs at the top section of the Field Strength Indicator, are as follows:

- The right hand AMBER LED is headed “Telegram Valid”. This signifies that an 868MHz signal has been detected.
- The left hand RED LED signifies that the signal strength is insufficient for a good installation. This LED will be illuminated immediately when the Power button is switched on.
- The AMBER “Class A” LED signifies that the installation will be good. The only proviso to this is that the Switch Receiver is not to be recessed in the wall or have any further potential screening situated around it, which could further increase signal attenuation.
- GREEN, the “Class B” LED, ensures an excellent installation, even if there is a little further screening caused, for instance by mounting it below a wall surface, assuming this is not in a metal box.

To get the best results, always hold the Transmitter exactly where it is intended to be installed and place the Field Strength Indicator exactly where the Receiver will be installed.

When the Transmitter is operated and the GREEN LED is illuminated, this signals that the receiving field force possesses sufficient power reserve for a reliable installation. There will be generous provision for subsequently changing conditions of the surroundings (i.e. additional screening caused by lightweight walls, shadowing by people etc.).

If the signal received is AMBER, repeat the test three times. If three AMBERS or a mixture of AMBER and GREEN are received, the installation will be good. The only proviso to this is that the Receiver is not to be recessed in the wall or further screened in any way, which in itself would increase any signal attenuation.

If just the RED LED is illuminated, this indicates that the present intended installation is not acceptable.

If the signal is not good enough in the initial layout, consider rearranging the position of the Switch Receiver to see if the signal strength can be improved.

How to use the Field Strength Indicator:

Person 1 operates the Transmitter and generates the radio signal by pressing the switch. Person 2 checks the field strength received on the display of the device and thus determines the ideal position.

Alternatively, if conducting the investigation alone, press the “1 min.” button on the Field Strength Indicator, then from the moment of pressing the Transmitter, you have that long to return to the indicator to determine the suitability of the proposed installation.



Field Strength Indicator K5419R

The Field Strength Indicator can be used for on-site determination of the ideal mounting position of the Transmitter and for identification of an interfering radio signal.

Even after careful planning, the Field Strength Indicator should be used to verify proper reception at the Switch Receiver position during installation.

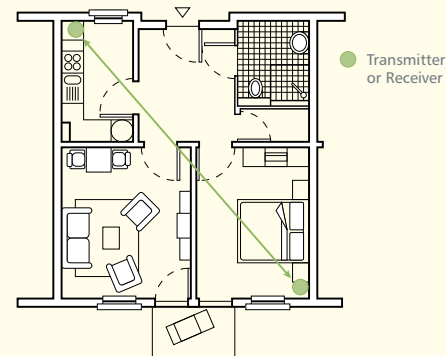
9. PLANNING INFORMATION FOR RESIDENTIAL BUILDINGS

For applications restricted to one or two rooms, e.g. when retrofitting a switch, the direct transmission range will normally be adequate. For applications “throughout” a building, the following differentiations must be made:

Flats, terraced houses and single-family houses of up to 400sqm.

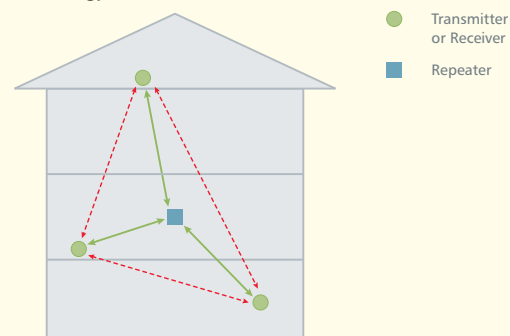
- Larger residential units with 3 rooms or more (living room and bedrooms) should be fitted with a Repeater. The Repeater should be centrally placed (e.g. in the centre of the middle floor).

Small residential unit (up to 3 walls and 1 ceiling)



Bedsit or up to 2 floors in a townhouse: the direct transmission range is usually adequate.

Multi-room flat and one-family house (more than 3 walls, more than 1 ceiling)



To ensure radio coverage in a larger residential unit, it is generally advisable to install a central Repeater.

10. TROUBLESHOOTING

The foregoing information on selecting the ideal place of installation for Transmitters and Switch Receivers has been provided to ensure a smooth operation of the devices. If, however, you still experience problems, please refer first to the following table for troubleshooting:

FAULT	POSSIBLE CAUSE	CHECKING AND POTENTIAL REMEDY
No transmission received	Transmitter fails to transmit	Close to the Transmitter (distance of around 20-50cm), the Field Strength Indicator does not receive a transmission signal: Activate the Transmitter, the GREEN LED fails to illuminate. Result – The Transmitter appears to be faulty. Replace the Transmitter.
	Transmitter installed outside the receiver range	Near the receiver (distance of around 20 - 50cm), the Field Strength Indicator does not receive a transmission signal: Activate the Transmitter, the GREEN and AMBER LEDs fail to illuminate. Result – Reposition Transmitter or Switch Receiver and follow the information on coverage and installation. Possible need for a Repeater to be added.
	Transmitter was removed (or maybe exchanged)	Always remember to delete the Transmitter from the Switch Receiver's memory before removing it, and/or always add any new transmitter to the Switch Receiver's memory.
	Receiver does not receive	Close to the Switch Receiver the Field Strength Indicator demonstrates good reception of the transmitted signal: Activate the Transmitter; the GREEN or AMBER LED of the Field Strength Indicator is illuminated. Result – Check the receiver is functioning and replace the Switch Receiver if necessary.
	Transmitter not programmed (or wrong Transmitter programmed)	Re-programme the Transmitter into the Switch Receiver.
	Some form of jamming is present	The GREEN Class A or AMBER Class B LEDs of the Field Strength Indicator are illuminated consistently: but the "Telegram Valid" LED is not illuminated. Result – There is some form of "jamming" occurring. Find and remove the source of jamming.
	High-frequency jamming near receiver	Move cause of jamming (telephone, PC etc.) at least 50cm away from the Switch Receiver.
Transmission only intermittently received	Receiver is placed at the limit of the transmitter's range	When placed near the Switch Receiver (at a distance of around 20-50cm) the Field Strength Indicator does not receive a proper transmission signal: When a Transmitter is operated, neither the GREEN nor AMBER classification LEDs of the Field Strength Indicator are illuminated, but the AMBER "Telegram Valid" LED is illuminated. Result – Poor reception, consider repositioning either the Transmitter or Switch Receiver, or alternatively use a Repeater.
	Occasional change in environmental conditions (cupboard, door, plants, people, interferes with transmission signal)	Check the distance from high-frequency sources of interference, should be at least 50cm. Alternatively, the Switch Receiver has been placed at the limit of the Transmitter's range.
	The position of the transmitter changes occasionally (e.g. transmitter fitted to a mobile object)	Ensure any movement does not cause the Transmitter to move outside the reception range.
	Some form of jamming is present	The GREEN or AMBER classification LEDs are illuminated only intermittently, but the AMBER "Telegram Valid" LED remains off (no valid echo™ transmission). Result – remove the cause of the jamming.

11. DISCLAIMER

The information provided in this document describes typical features of the Echo™ system and should not be misunderstood as specifying operating characteristics. No liability is assumed for errors and / or omissions. We reserve the right to make changes without prior notice.

To find out more, visit: www.mkelectric.co.uk

Transmitters

Standards and approvals

BS EN 60669-1, BS EN 60669-2-1,
 ETSI EN301 489-1 & -3, ETSI EN61000-6-2,
 ETSI EN300 220-3

Technical specification

Physical

Operating temperature:
 -5°C to +40°C

Operating frequency:
 868.3 MHz

IP rating:
 IP2XD

Max. Installation altitude:
 2000 meters



Dimensions

Transmitters: 86mm x 86mm

Fixing centres: 60.3mm

Mounting Transmitters

- All Transmitters can be mounted to any 1-gang back box.
- All can be mounted directly to the wall surface – screws supplied.
- All can be mounted to back boxes – screws supplied.
- Logic Plus and Aspect type Transmitters can also be mounted using supplied adhesive pads

Switch Receivers and Repeater

Standards and approvals

BS EN 60669-1, BS EN 60669-2-1,
ETSI EN301 489-1 & -3, ETSI EN61000-6-2,
ETSI EN300 220-3

Technical specification

ELECTRICAL

K5418R

Voltage rating:
250V a.c. 50Hz

Current ratings:

This is a small load switch receiver that can be used typically for 400W resistive loads and 360W inductive.

Terminals:

Terminal screw size: M2.6
Rated terminal screw torque: 0.4 Nm

Terminal capacity:

Single wire (solid): 1.5 mm²
Stranded wire (flex.): 1.0 mm²
Stranded wire with ferrules: 0.75 mm²

K5420R (When used as a receiver)

Voltage rating:
250V a.c. 50Hz

Current ratings:

10AX – No de-rating when used on standard magnetic ballast fluorescent loads.

Terminals:

Terminal screw size M3
Rated terminal screw torque: 0.5 Nm

Terminal capacity:

4 x 1mm²
3 x 1.5mm²
2 x 2.5mm²

PHYSICAL

Operating temperature:
-5°C to + 40°C

IP rating:
IP2XD

Max. Installation altitude:
2000 meters



K5418R



K5414R



K5420R

K5420R

The 10AX Receiver/Repeater can function both as a 1 level repeater and as a 10AX Switch Receiver.

K5414R

The Repeater does not pass current, but all other details are the same as the 10AX Switch Receiver/Repeater K5420R.

Dimensions

10AX Switch Receiver/Repeater – K5420R

Length: 175.5mm

Width: 50.3mm

Height: 33.25mm

1 Level Repeater - K5414R

Length: 175.5mm

Width: 50.3mm

Height: 33.25mm

Small Load Switch Receiver – K5418R

Length: 47.4mm

Width: 34.6mm

Height: 28.8mm

For complete technical information on all Echo™ products, please visit www.mkelectric.co.uk

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