ABELTRONICS
t: 01603 881076 e: sales@abeltronics.co.uk
www.abeltronics.co.uk
Unit 3 Frans Green Ind Est • Sandy Lane
East Tuddenham • Norfolk • NR20 3JG • UK

Low Voltage Radio Controlled Dimmer Modules: DIM15, DIM15HP

Features:

- 9 – 32V DC low voltage operation
- Up to 10A/16A load, no minimum load requirement
- Lamp saving soft-start function
- Works with LEDs, incandescent or halogen lamps
- Flickerless dimming of LEDs (240Hz operation)
- Drives the lamp on the high (positive) side
- Radio Controlled – up to 150m range
- 16-bit resolution high-accuracy PWM, 256 dimming steps
- Fully protected and ruggedized
- IP68 Rated, fully waterproof and hermetically sealed
- 3-button keyfob transmitter: increase/decrease brightness and lamp on/off

Applications:

- Remote controlled lights
- Remote controlled dimming
- Yachts, boats, caravans, cars trucks and lorries
- Remote controlled signage, architectural lighting, mood lighting

The ABELtronics DIM15 and DIM15HP are fully self-contained radio controlled dimmer modules designed to remotely control the brightness of low-voltage incandescent (filament), halogen or LED lamps rated up to 10A (or 16A for DIM15HP). The units are remote controlled with one or more keyfob-style radio transmitters, allowing the lamp brightness to be increased or decreased from up to 150m away. No direct line of sight is needed unlike infra-red. Operating from 9 to 32V DC, the modules can be used in a wide variety of applications where DC low-voltage remote brightness control is desired, such as 12V or 24V automotive or marine dash-panels, low voltage architectural lighting, low voltage advertising applications, LED backlighting, pond lighting, hazardous area lighting, etc.

The units employ a very efficient PWM (pulse-width modulation) switching technique to provide excellent operation for high current loads, and are fully protected against intermittent output short-circuits, input over-voltage and under-voltage conditions. The modules will remotely control lamp brightness from 0% (fully off) to 100% (fully on) and they can turn the lamp on and off.

Please note that the PWM dimming technique may not be suitable for non-dimmable encapsulated LED lamps containing internal driver circuitry, such as some low-energy replacements for dichroic lamps. Also, the modules are not suitable for connection to standard household lighting transformers as these supply AC and not DC voltage.

The unit also features a removable antenna and ability to be controlled by up to 50 unique radio transmitters. See below for more information.

Parameter	DIM15	DIM15HP	Comment
Nominal Supply Voltage Range	9 – 32 V DC		
Quiescent Current, max	25mA		at maximum operating voltage
Maximum Output Current	10A	16A	
Maximum Load Power	120W at 12V or 240W at 24V	196W at 12V or 384W at 24V	
Peak Output Current	30A	45A	<10sec at nominal operating voltage
Radio Receiving Frequency	433.92 MHz (AM)		Licence Exempt
Operable Radio Range (outdoor)	<150m		Line of sight, optimal conditions
Operable Radio Range (indoor)	<50m		Optimal indoor conditions
Operating Temperature Range	–5 – 70°C (23 – 160°F) – DIM15 & DIM15HP		
	–40 – 70°C (–40 – 160°F) – DIM15E & DIM15HPE		‘E’ suffix denotes extended temperature range
PWM Switching Frequency	240 Hz, 0% – 100% Duty Cycle		±3%
Dimensions: Dimmer Module	52 × 76 × 36mm		L × W × H ±3% excl. fixing tab and antenna
Mechanical Fixing	2× 5.2mm dia, 20mm pitch		Zinc-plated steel fixing bracket
Electrical Connection	3× Wire lead output >30cm long		
Antenna Length	162mm		

Keyfob Radio Transmitter:

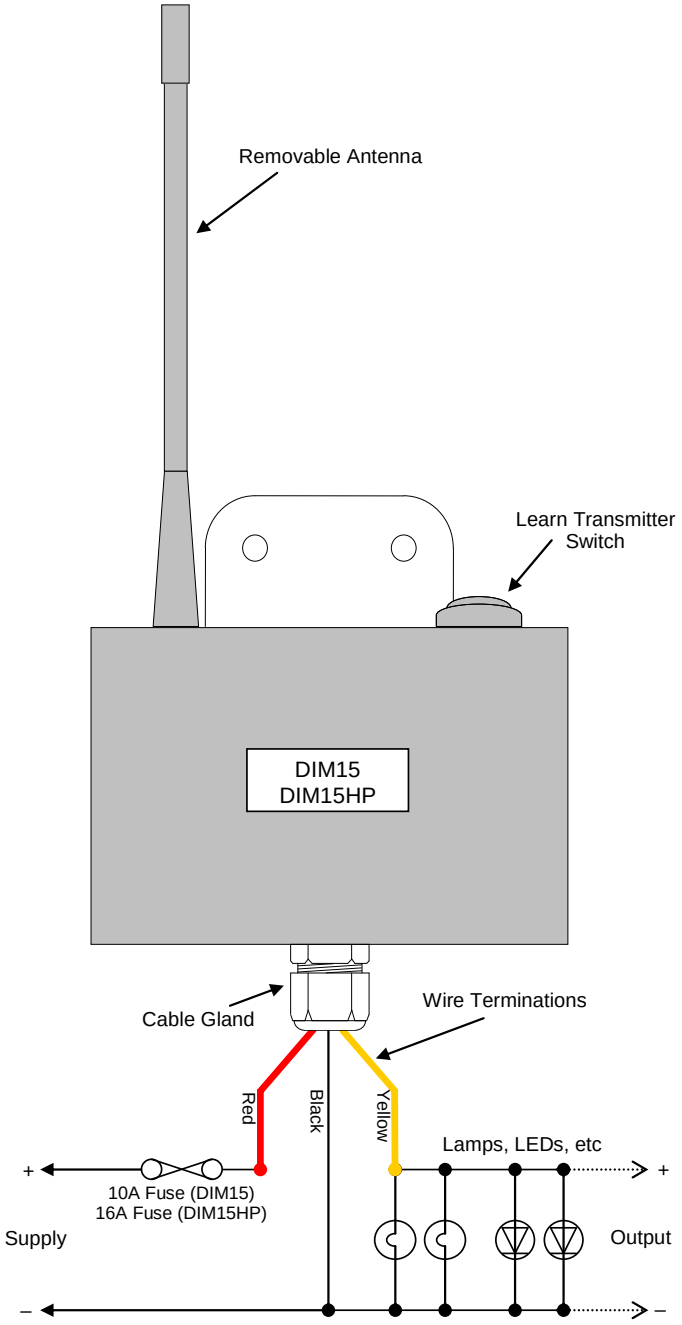
Radio Transmitting Frequency	433.92 MHz	
Transmitting Power	<10mW	
Transmitter Dimensions	66 × 36 × 17mm	L × W × H ±3% excl. key ring
Transmitter Power Source	12V GP23A (or similar) Lighter Battery	

ABELTRONICS
t: 01603 881076 e: sales@abeltronics.co.uk
www.abeltronics.co.uk
Unit 3 Frans Green Ind Est • Sandy Lane
East Tuddenham • Norfolk • NR20 3JG • UK

Mounting and Connection Guidelines

The DIM15 and DIM15HP are IP68 rated and are mounted in an ABS enclosure filled with high temperature epoxy resin. They are wire-ended and the cables terminate to the module enclosure with a cable gland. The cap of the cable gland is removable without any loss of ingress protection, and can be removed to form a neat termination with flexible conduit or sleeving. The wire terminations are 30cm or greater in length and should be connected to external circuitry with a suitable junction box or connection block. The function of the wires is summarised below:

Wire Colour	Function	Cable Size
Red	+ Supply	32/0.2, 3.1mm dia
Black	Ground	24/0.2, 2.4mm dia.
Yellow	+ Output	32/0.2, 3.1mm dia



The positive supply typically comes from a suitably rated low-voltage DC supply in the range 9 – 32V which must be fused at 10A (DIM15) or 16A (DIM15HP) or less to protect the module. The DIM15 will run warm when operating loads exceeding 6A, therefore it is important to securely bolt the metal fixing tab to a suitable metal surface to allow any heat to be dissipated. The units should be mounted in a cool location, away from sources of heat.

Keyfob Transmitter

The module is controlled by the supplied keyfob radio transmitter (shown below).

The transmitter has three buttons, plus an activity LED which flashes whenever any of the three buttons is pressed. The triangular button increases the lamp brightness, the circular button decreases the lamp brightness, and the red button turns the dimmer on and off (toggle action – press once for 'on', press again for 'off'). The lamp brightness will ramp up or down for as long as the triangular or circular buttons are pressed. Ramp time from fully off to fully on is approximately 10 seconds. The DIM15 will store the current dim setting when the lamp is turned 'off' with the red button or when power is removed.

The DIM15 also stores the current on or off state – when power is removed from the module, the DIM15 will default to the previous on or off state upon reapplication of power. In other words, if the lamp was 'on' at 50% brightness, removing the power to the module and reapplying it will cause the lamp to go 'on' at 50% brightness. Similarly, if the lamp is 'off' upon loss of power, the module will restart in the 'off' state. This avoids any power glitches from interfering with the connected lamp.

The keyfob is 66mm long, 36mm wide and 17mm high and comfortably fits on a keychain in the pocket. It is powered by a miniature 12V GP23A lighter battery which is accessible by undoing the bottom screw and disassembling the case.

The transmitter operates in the 433.92MHz AM licence-exempt frequency band and is EMC certified for use in the UK and Europe. (315MHz FCC certified versions are available on request for customers in the USA).

ABELTRONICS
t: 01603 881076 e: sales@abeltronics.co.uk
www.abeltronics.co.uk
Unit 3 Frans Green Ind Est • Sandy Lane
East Tuddenham • Norfolk • NR20 3JG • UK

Radio Reception and Achieving Optimal Range

The DIM15 and transmitter are capable of operating at ranges up to 150 metres, but as with all radio based remote control systems, the range is directly affected by the environment in which the devices are used. Optimal conditions are:

1. DIM15 antenna within direct line of sight of the transmitter
2. Receiver antenna well away from metallic objects
3. No buildings, trees, vehicles or people causing radio absorption or reflections.
4. No other devices operating in nearby frequency bands causing interference
5. Operating well away from sources of electrical interference; switched mode power supplies, TVs, PCs, large motors, etc.

Transmitting range in wholly sub-optimal conditions (i.e. opposite to those above) could be restricted 50 metres or less.

Learning a New Transmitter

The DIM15 is supplied with one pre-taught transmitter keyfob, but additional keyfobs can be purchased separately to operate the unit. Please visit www.abeltronics.co.uk/products/dim15-trans to purchase additional transmitters. The DIM15 is capable of learning up to 50 different transmitters and unlimited DIM15 modules can be operated from the same transmitter. For this reason, any additional transmitters will need to be 'taught' to the module.

With reference to the diagram on the previous page, the 'learn switch' is mounted beside the antenna on top of the module, and the 'learn LED' is the green LED in the centre of the switch. The module will turn off the connected load during the learn procedure.

To learn a new transmitter:

1. Briefly press the 'Learn Transmitter' Switch on the top of the module.
2. 'Learn' LED (in the centre of the switch) will illuminate green.
3. Press one of the buttons on the transmitter once, 'Learn' LED will extinguish.
4. Press one of the buttons on the transmitter again, 'Learn' LED will flash for 10 seconds.
5. Wait for Learn LED to stop flashing.
6. This transmitter will now operate the module.
7. Repeat steps 1-6 for every transmitter that is required to operate the DIM15.

Please note that during use the 'Learn' LED flashes when the DIM15 receives any 433.92MHz AM signal, but the module will only respond to a signal from pre-taught transmitters.

Erasing the DIM15 Memory

To provide extra security, in the event of a lost transmitter for example, the module's memory can be completely erased of ***all*** the transmitters previously taught to it, preventing a lost transmitter operating the system.

To erase the module's memory:

1. Press and hold 'Learn Transmitter' switch for 10 seconds.
2. Release the 'Learn Transmitter' switch and the LED flashes while the module erases its memory.
3. All remaining transmitters will need to be re-taught to the receiver after the erase is complete.

Further Information

For more information, links to other products and to download the most current datasheet: www.abeltronics.co.uk/dimmers. If you have any questions or queries, or require one of our dimmers to be modified to fit your application, please contact us by visiting www.abeltronics.co.uk.