DALI Command MultiDim
intelligent lighting control system

Introduction
The Philips MultiDim system consists of an integrated range of DALI compatible devices that can be combined to produce a fully functional lighting control system for use with DALI ballasts and Lamp Interface Units*.

The MultiDim range includes controllers, configuration software and a DALI/LON Gateway that allows multiple DALI systems to be integrated with LON based building management systems. All of the MultiDim components have been designed to work together to make the installation of a DALI network as simple and as trouble free as possible.

This datasheet covers the basic MultiDim control products that will form the basis of a DALI system, and includes details and specifications for the following products:

• Modular Control Panels DCMD100 - DCMD170
• MultiSensor DCMD302
• IR Remote Control DCMD303
• Transistor Dimmer DCMD450
• DIN Rail Power Supply DCMD400
• Ceiling Mounted Power Supply DCMD401

Related Products
• Philips HF-Regulator DALI compatible Ballasts. Refer to the separate datasheet for details
• MultiDim PC Programming Kit (DCMD502). Provides a complete, PC based, solution for the design and configuration of MultiDim Systems. Includes MultiDim PC Serial Interface (DCMD501), MultiDim Programming Point (DCMD200/180) and a fully working copy of MultiDim Toolbox configuration software. Refer to the DCMD502 datasheet for details
• DALI/Lon Gateway (DCMD430). Allows multiple DALI systems to be integrated with LON based building management systems. Refer to the DCMD430 datasheet for details
• DALI/Push-button interface (DCMD444). Allows push buttons from other manufacturers to be connected to the system.

* This document uses the general term “Lamp Interface Unit” (or its abbreviation “LIU”) to mean any DALI compatible electronic lamp controller. A Lamp Interface Unit can be a fluorescent ballast, a transistor dimmer for incandescent lamps, or any other device designed to directly drive a particular lighting technology.

About DALI
DALI (Digital Addressable Lighting Interface) is a new international standard (IEC929) for lighting control systems. The main features of the DALI standard are as follows:

• Individual Control of Lamps. Each unit in the DALI network has its own individual address and can be controlled independently.
• Multi-Channeling. A single control cable can be used to control several different groups of lamps.
• No Mains Switching. Required. Lamps can be dimmed or switched on and off using control system commands without any need for mains switching.
• Back-Channelling. The information flow on the connecting cable is bi-directional. In addition to commands from controllers, the cable can also carry status information on the lamp’s operating condition.
• Simple Wiring. All of the units in the system are interconnected using a simple two-core cable with few restrictions on topology. Up to 64 devices can be connected with a maximum cable length of 300 metres.
• Easy System Re-Configuration. The operation of the system can be changed quickly without any modification to the hardware.
• Easy System Modification. If the lighting system needs to be enlarged, new components can be added anywhere on the DALI cable. Existing units can easily be reconfigured to suit changing usage patterns.
DALI Command MultiDim
intelligent lighting control system

Introduction
The MultiDim product range provides a complete and fully integrated means of creating a DALI based digital control systems. MultiDim components support all of the basic functionality of a standard DALI system and are easy to install and configure. Designing a MultiDim system is a very straightforward process, but there are several things that you need to be aware of. The information on these two pages should provide everything that you need to know.

DALI Compatibility and Compliance
The MultiDim controllers can be used with any DALI compatible ballast or Lamp Interface Unit. In addition, all MultiDim Lamp Interface Units (such as the 800 Watt Dimmer) and the DALI-Lon Gateway can be used in conjunction with other manufacturer’s DALI compatible control systems. However, it may not be possible (and is not recommended) to use MultiDim controllers on the same system as other types of DALI controller.

Cable Choice
The electrical specification for DALI systems provides a great deal of flexibility in both the choice of cable used and how it is installed. The basic requirements are:

• The cable be mains rated.
• 2 wire, 0.5 - 1.5 mm²
• The maximum voltage drop on the DALI cable must not exceed 2 Volts (for standard cables, this means that the total length of connecting cable can be up to 300 metres).

This means that standard mains cable can be used successfully - particularly useful where a system is being retrofitted to an existing installation.

Cable Topology
As you can see from the layout diagram opposite, there are few restrictions of the cable topology.

No special terminations are required, and there are no complex rules about how the nodes should be connected together.

Ring configurations should be avoided, but otherwise the only requirements are that the cable be continuous throughout, and that each node be connected to the cable at some point.

Nodes can be daisy chained together in series and spurs be added at any point. The cable topology can be optimised to either simplify testing or to minimise cable use.

DALI Connections
All MultiDim units are fitted with removable connectors with paired terminals for the DALI connection. These provide a simple means of linking through, and the only requirement is to maintain the power supply polarity throughout the system.

Power Supply Requirements
MultiDim Controllers without a direct mains connection must be provided with power via the DALI control cable. This has the advantage that no additional power cabling is required, but it does mean that you have to ensure that an adequate power supply is available on the system. This supply must be designed for DALI use and be capable of providing sufficient power to supply the controllers connected to the system. In addition, to maintain signalling integrity, it must not be capable of providing more than 250 mA to the system.

See page 10 for details of the dedicated MultiDim Power Supply Units.

About MultiDim Systems

Configuration
All MultiDim units are fully configurable. They are supplied pre-configured with factory default settings that ensure that a system will be functional as soon as the power is applied.

This has the advantage that a newly installed system will provide basic operation from the moment the power is first applied. For simple systems, this may be all that is required. But for systems that are more complex (and to gain access to advanced MultiDim functions) the system must be reconfigured using one of three different methods:

• Configuration Using Button Controllers. Eight and five button MultiDim panel controllers provide some limited configuration features from the control buttons. These include the ability to store four pre-set light levels and the ability to customise those levels.

• Configuration Using the IR Remote Control Unit. The MultiDim IR remote control unit can be used to configure a number of advanced system functions. For more details see page 9 of this datasheet.

• Configuration Using MultiDim Toolbox software. The MultiDim Toolbox (DCMD502) is a Windows based software configuration tool, designed to make setting up a complex system as simple as possible. See the MultiDim Toolbox datasheet for more details.

MultiDim Terminal Connections Using Standard Cable.

MultiDim Terminal Connections Using Screened Cable (optional).
1. The MultiDim system can be used with any DALI compliant electronic ballast for fluorescent lamps.

2. Power for the controllers can be supplied by the DCMD401 (illustrated) or the DCMD400 DIN rail-mounted power supply or any mains connected MultiDim unit such as the DCMD450 Dimmer.

3. Low-cost cable can be used to interconnect all of the system components. The recommended total length of the cable is max. 300 m.

4. The MultiDim Multisensor provides IR, light-level and occupancy sensor, which can be used independently or in combined to provide energy-saving functions such as automatic operation and constant light level.

5. The MultiDim DCMD450 800 Watt dimmer is a fully compliant DALI LIU for use with incandescent lamps and low-voltage electronic transformers.

6. The single-gang panels can contain one of the control modules. The modules are available as sliders, rotary controls or button panels.

7. The double-gang panels can contain up to three controller modules. The modules are completely interchangeable within the panel, and custom panels can be created as desired.

8. The MultiDim IR remote control unit provides both means of controlling individual units and a simple configuration tool. All of the modular controllers and the MultiSensor are fitted with IR sensor and can be used with the remote control.
Introduction
A range of DALI compatible manual control panels that can be configured to suit almost any control requirement. The range includes pushbutton, rotary, and slider control modules, all of which can be inserted into either single or triple gang fascia panels. The modular construction provides flexibility and allows many different panel configurations to be constructed.

Configuration
Each control is supplied pre-configured with immediately usable default settings, but can be easily re-configured to suit a particular application using either the MultiDim IR Remote, or MultiDim Toolbox configuration software. The eight and five button controllers also provide limited configuration features using the control buttons.

All of the control modules are fitted with indicator LEDs and an IR receiver that allows the module operate with the MultiDim IR remote control unit.
**Module Dimensions**
The chassis plates and fascia panels are designed to fit both DIN and UK standard backboxes with a minimum depth of 35 mm.

**Mechanical Data**
The modular controllers are available in satin white plastic finish. The various control panel combinations can be constructed from the following separately packaged components:

The Control Modules (see opposite for variations):

- Single gang chassis plate and fascia panel, designed for use with a standard, single gang backbox. This provides a mounting for a single module.

- Triple gang chassis plate and fascia panel, designed for use with a standard, double gang backbox. This provides a mounting for up to three modules.

**DALI Cable Connection**
Standard MultiDim removable connectors with paired terminals. A connection between the SC terminal and a local earth is required for EMC protection.

**Module Power Supply Requirements**
13-19 V, 10 mA supplied via DALI network cables.

**Conformity & Standards**

**EMC**
- Emission: EN 55 015
- Immunity: EN 61 547

**Safety**
- Safety: EN 60 669-1, IEC 60 669-2-1
- Isolation: 4 kV
- IP rating: 30

**Environmental Requirements**
- Ambient temperature: 0...35°C
- Storage temperature: -10...+70°C
- Relative humidity: 90% maximum, non-condensing.
**DALI Command MultiDim**

**intelligent lighting control system**

**Introduction**

A ceiling mounted module, containing the sensors required to provide an automated DALI lighting control system. The MultiSensor contains an Infra-Red receiver for use with the MultiDim IR Remote, a constant light sensor (which measures reflected light from below the device), and a PIR occupancy sensor with a range of up to 4.5 metres.

**PIR Operation**

The PIR sensor can be used on its own to provide automatic control of lighting depending on the room’s occupancy. The operation and timing of the PIR is fully configurable and includes the ability to set the unit to provide “off only” operation and an adjustable “PIR transition time” that can improve the life-span of fluorescent tubes used in corridor applications.

**Local Switch**

The MultiSensor is provided with terminal connectors for a local wall switch. This provides a manual dimming function if required.

**Configuration**

The MultiSensor is supplied pre-configured with immediately usable default settings. However, it can be easily re-configured to suit a particular application using either the MultiDim IR Remote, or MultiDim Toolbox software.

In addition, the MultiSensor is fitted with five rear mounted DIL switches that will allow some of the main functions to be pre-configured. The DIL switch settings are applied when power is first applied but can be overridden using the MultiDim IR Remote, or MultiDim Toolbox software.

**Constant Light Operation**

The PIR and constant light sensors operate together to provide automatic constant light control of the surrounding lamps.

For effective constant light operation, careful positioning of the MultiSensor is essential. In particular, it is important to ensure that the sensor is not exposed to direct light, and that it is positioned in such a way that most of the light that it receives is under its control. Mount the MultiSensor away from direct light entering through windows. See the installation instructions for more details. The constant light feature is disabled by default and must be enabled using the MultiDim IR Remote Control or MultiDim Toolbox software.
**Fixing Data**
The MultiSensor’s housing is designed for push fit mounting into a ceiling, or inside a luminaire casing. Its spring-loaded mounting system will allow it to be fitted into a wide range of fixing materials, including sheet metal and fibrous ceiling tiles. For thin materials, a slightly smaller mounting hole is required.

**DALI Cable Connection**
Standard MultiDim removable connectors with paired terminals.

**Module Power Supply**
13 - 19 V, 15 mA supplied via DALI network cables.

**Constant Light Sensor**
- **Viewing Angle:** 100° (40° with viewing angle restrictor)
- **Range:** 5 - 5000 lux.
- **SW1 Switch Functions:**
  - On: Set level to nominal value
  - Off: Defaults to maximum
- **IR Receiver**
  - **Operation:** Omni-directional
  - **Frequency:** 36 kHz
  - **SW2 Switch Functions:**
    - On: Receives all remote control commands
    - Off: Ignores remote control commands (except configuration commands)
- **PIR Sensor**
  - **Operation:** Omni-directional pyro-electric
  - **SW3 Switch Functions:**
    - On: Last level recall
    - Off: PIR response ignored
  - **SW4 (PIR Test) Switch Functions:**
    - On: Timeout reduced to 10 seconds - use for testing
    - Off: Normal PIR function (default 20 minute time-out)
- **Local Switch**
  - **Operation:** Single mechanical switch connected as shown provides “touch dimmer” style operation.
  - **SW5 Switch Functions:**
    - On: Local Switch enabled.
    - Off: Local Switch disabled.

**Conformity and Standards (EMC)**
- **Emission:** EN 55 015
- **Immunity:** EN 61 547
- **Safety:** IEC 60 950
- **Isolation:** 4 kV
- **IP rating:** 30

**Operating Conditions**
- **Ambient temperature:** 0…+50°C
- **Storage temperature:** -10…+70°C
- **Relative Humidity:** 90% maximum, non-condensing

---

**Manual Configuration Using the MultiSensor’s DIL switch**

**Connecting a Local Switch**

**Fitting the Constant Light Sensor Viewing Angle Restrictor**
Introduction
The MultiDim Infra-red remote control is designed to work in conjunction with all Philips MultiDim products fitted with an IR receiver, including the Philips MultiDim control panels and MultiSensor.

The IR Remote is a dual function device. Its main purpose is to provide a simple and intuitive remote control for MultiDim control systems.

When used as such, it provides a number of basic functions, including On/Off, Raise/Lower, and selecting from four predefined Scenes.

However, the IR Remote can also be used as a basic configuration tool for simple systems where the use of MultiDim Toolbox and its associated Programming Point is inconvenient.

In this case, the control buttons are used in combination to provide basic configuration functions. This includes, creating and adding to groups of lamps, setting pre-set scenes and disabling or enabling IR receivers. The IR Remote will allow the settings to be locked to prevent the user from accidentally making changes to the configuration.

Basic Control Functions
On/Off
Recall Scene 1-4
Raise/Lower lamp levels
Store Scene

Configuration Functions
Set default Preset Levels (1 = 100%, 2 = 75%, 3 = 50%, 4 = 25%)
Creating Group
Add to Group
Creating Scene
Restrict the IR Control signal to Specific Groups
Disable/Enable IR sensors on specific controllers
Configuration Lock (prevents users inadvertently changing the settings)

Technical Data
Power: 2 x IEC, LR03/AAA, 1.5 V Battery
Weight: 50 g
Operating Frequency: 36 kHz
Size: 120 mm x 57 mm x 24 mm
**Introduction**

The MultiDim 800 Watt Transistor Dimmer is a fully DALI compatible Lamp Interface Unit, designed to allow incandescent lamps to be incorporated into a DALI controlled lighting system.

The dimmer is a DIN-rail mounted unit that can control a maximum load of up to 800 W. It can be connected to mains voltage lamps directly, or to low voltage lamps via an electronic transformer designed for both capacitive and resistive loads.

The dimmer is provided with local switch terminals, an indicator LED, a physical selection switch and a built-in DALI power supply.

**Additional DALI Functions**
- Min/Max levels, Scenes, Groups
- Lamp status report
- Dimmer status report

**Connection**

**DALI:**
- Standard MultiDim removable connectors with paired terminals

**Mains:**
- < 4 mm² solid core
- < 2.5 mm² stranded

**Power**

**Mains Supply:**
- 220-240 VAC, 50 Hz
- 250 mA

**Operating Conditions**

**Ambient Temperature:**
- 0...35°C

**Relative Humidity:**
- 90% max, non-condensing.

**Mechanical data**

**DIN-rail case 88 mm wide (5 M)**

**Conformity & Standards (EMC)**

**Emission:**
- EN 55 015

**Immunity:**
- EN 61 547

**Safety**

**Safety:**
- EN 60 950

**IP rating:**
- 30

**Isolation:**
- 4 kV, Mains to dimmer unit
  - (Basic, Dimmer internal isolation to DALI terminals)

**Installation Notes**

1. The dimmer is for use with incandescent lamps and low voltage electronic transformers. It is not suitable for use with fluorescent ballasts or conventional transformers.
2. The external supply must be protected. It is recommended that a 6 A MCB is used.
3. All cabling must be 230 V mains rated.
4. For installation in a restricted access location only.
**Introduction**

Power for MultiDim devices can be supplied from a number of different sources. All mains connected MultiDim units (such as the 800 Watt Dimmer) are provided with an internal DALI power supply. If the system contains one of these, it will provide an ideal source of power.

Alternatively, a dedicated MultiDim power supply unit (DCMD 400 or DCMD 401) can be used. Both of these units have similar output capabilities and can supply the maximum of 250 mA permitted for a DALI system. However, the DCMD 400 is designed for DIN rail mounting in a control cabinet and the DCMD 401 for mounting in a ceiling void.

Note that, if a power supply unit is connected to the system, no other source of power may be used.

**Technical Data**

**Mains Supply**
- DCMD400: 230 VAC (nom), 197-264 VAC (abs);
  50 Hz (nom), 48-62 Hz (abs)
- DCMD401: 230 VAC -10%/+6%, 50-60 Hz

**DALI Supply Output**
- 250 mA (nom)

**Ambient Temperature**
- DCMD400: 0...50°C
- DCMD401: 0...40°C

**Relative Humidity**
- 90% max, non-condensing

**IP rating**
- 30

**Mechanical Data**
- DCMD400: DIN Rail case 70 mm (4 M)
- DCMD401: Standard MultiDim removable connectors with paired terminals

**Mains Cable**
- DCMD400: < 4 mm² solid core
  < 2.5 mm² stranded
- DCMD401: 1.5 m, 2 x 0.75 mm² stranded

**DALI Cable**
- DCMD400: 1 m, 2 x 0.75 mm² stranded

**Installation Notes**
1. The external supply must be protected. It is recommended that a 2A MCB is used.
2. All cabling must be 230 V mains rated.
3. The DCMD400 is for installation in a restricted access location only.
# DALI Command MultiDim

## intelligent lighting control system

## MultiDim DALI Controllers

### Ordering and packing data

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Ordering number</th>
<th>EAN1 code</th>
<th>EAN3 code</th>
<th>Weight</th>
<th>Qty.</th>
<th>Dimensions</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCMD100</td>
<td>MultiDim rotary module</td>
<td>9137 005 308...</td>
<td>8711500 747921</td>
<td>0.076</td>
<td>1</td>
<td>10.0 x 6.0 x 5.2</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>DCMD110</td>
<td>MultiDim single slider module</td>
<td>9137 005 309...</td>
<td>8711500 747938</td>
<td>0.079</td>
<td>1</td>
<td>10.0 x 6.0 x 5.2</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>DCMD111</td>
<td>MultiDim twin slider module</td>
<td>9137 005 310...</td>
<td>8711500 747945</td>
<td>0.079</td>
<td>1</td>
<td>10.0 x 6.0 x 5.2</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>DCMD121</td>
<td>MultiDim 2-button on/off module</td>
<td>9137 005 311...</td>
<td>8711500 747952</td>
<td>0.079</td>
<td>1</td>
<td>10.0 x 6.0 x 5.2</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>DCMD122</td>
<td>MultiDim 2-button raise/lower module</td>
<td>9137 005 312...</td>
<td>8711500 747969</td>
<td>0.074</td>
<td>1</td>
<td>10.0 x 6.0 x 5.2</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>DCMD123</td>
<td>MultiDim 5-button module</td>
<td>9137 005 313...</td>
<td>8711500 747976</td>
<td>0.077</td>
<td>1</td>
<td>10.0 x 6.0 x 5.2</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>DCMD125</td>
<td>MultiDim 7-button module</td>
<td>9137 005 314...</td>
<td>8711500 747983</td>
<td>0.077</td>
<td>1</td>
<td>10.0 x 6.0 x 5.2</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>DCMD126</td>
<td>MultiDim 8-button module</td>
<td>9137 005 315...</td>
<td>8711500 747990</td>
<td>0.075</td>
<td>1</td>
<td>10.0 x 6.0 x 5.2</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>DCMD150</td>
<td>MultiDim single blank module</td>
<td>9137 005 316...</td>
<td>8711500 748003</td>
<td>0.049</td>
<td>1</td>
<td>10.0 x 6.0 x 5.2</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>DCMD170</td>
<td>MultiDim IR receiver module</td>
<td>9137 005 317...</td>
<td>8711500 748010</td>
<td>0.072</td>
<td>1</td>
<td>10.0 x 6.0 x 5.2</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>DCMD180</td>
<td>MultiDim programming point module</td>
<td>9137 005 318...</td>
<td>8711500 748027</td>
<td>0.066</td>
<td>1</td>
<td>10.0 x 6.0 x 5.2</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>DCMD300</td>
<td>MultiDim double frame - white</td>
<td>9137 005 319...</td>
<td>8711500 748034</td>
<td>0.165</td>
<td>1</td>
<td>20.0 x 12.3 x 4.4</td>
<td>0.0011</td>
<td></td>
</tr>
<tr>
<td>DCMD305</td>
<td>MultiDim single frame - white</td>
<td>9137 005 320...</td>
<td>8711500 748041</td>
<td>0.096</td>
<td>1</td>
<td>12.2 x 10.0 x 4.4</td>
<td>0.0005</td>
<td></td>
</tr>
<tr>
<td>DCMD302</td>
<td>MultiDim ceiling multisensor</td>
<td>9137 005 301...</td>
<td>8711500 747877</td>
<td>0.108</td>
<td>1</td>
<td>10.4 x 9.7 x 7.3</td>
<td>0.0007</td>
<td></td>
</tr>
<tr>
<td>DCMD303</td>
<td>MultiDim IR remote control</td>
<td>9137 005 302...</td>
<td>8711500 747884</td>
<td>0.090</td>
<td>1</td>
<td>10.0 x 6.0 x 2.9</td>
<td>0.0002</td>
<td></td>
</tr>
<tr>
<td>DCMD400</td>
<td>MultiDim DIN rail-mounted power supply</td>
<td>9137 005 304...</td>
<td>8711500 747891</td>
<td>0.166</td>
<td>1</td>
<td>11.0 x 8.0 x 6.8</td>
<td>0.0006</td>
<td></td>
</tr>
<tr>
<td>DCMD401</td>
<td>MultiDim ceiling-mounted power supply</td>
<td>9137 005 303...</td>
<td>8711500 748744</td>
<td>0.592</td>
<td>1</td>
<td>12.0 x 5.1 x 6.3</td>
<td>0.0044</td>
<td></td>
</tr>
<tr>
<td>DCMD444</td>
<td>MultiDim DALI/push-button interface</td>
<td>9137 001 820...</td>
<td>t.b.a.</td>
<td>t.b.a.</td>
<td>t.b.a.</td>
<td>t.b.a.</td>
<td>t.b.a.</td>
<td>t.b.a.</td>
</tr>
<tr>
<td>DCMD450</td>
<td>MultiDim 800 W dimmer</td>
<td>9137 005 306...</td>
<td>8711500 747914</td>
<td>0.258</td>
<td>1</td>
<td>10.1 x 9.1 x 6.3</td>
<td>0.0006</td>
<td></td>
</tr>
<tr>
<td>DCMD520</td>
<td>MultiDim PC programming kit</td>
<td>9137 005 307...</td>
<td>8711500 749802</td>
<td>0.960</td>
<td>1</td>
<td>27.2 x 22.8 x 5.5</td>
<td>0.0050</td>
<td></td>
</tr>
</tbody>
</table>

* For all MultiDim products the EAN1 code and the EAN3 code are the same.