Product details

• The LRC1020/1025 is a multifunctional light controller. Combined with a Philips movement detector, infra-red receiver and/or light sensor, it is a versatile local control system specifically designed for energy saving solutions with dimmable luminaires.
• TRIOS is simple in concept; it is easy and quick to install and requires no functional commissioning.
• External facilities are not needed to change the functionality of the unit. Sensors can be connected in any combination. The unit identifies the connected sensor configuration and automatically adapts its functionality accordingly.
• The single-channel light controller can switch any type of lighting load up to 5A. The control output can sink up to 25 mA (sufficient to regulate 50 dimmers (LRD8000 or LRD8010) or 150 Philips 1-10V dimmable electronic ballasts (ETC/R, HF-R, HF-Ri).
• Philips sensors and light controllers have modular sockets so that they can be connected with standard sensor cables. The light controller has a single modular input socket for sensors. A modular branching connector is needed when more sensors have to be connected. Branching connectors have to be ordered or obtained separately.
• The unit’s group and channel address can be changed for IR remote control in open-plan offices (seven groups) or for customised light scenes in multi-task working areas (five channels). Group and channel addresses are changed remotely with the OmniProg IRT8099/10, without access to the unit or opening the ceiling.
• The unit has an analogue (1-10 Vdc) input for one potentiometer, and a digital input for one or more low voltage push-button switches (“toggle” ON/OFF).
• The LRC1020 is the installer box version. The front panel has four, 19mm wide slots with removable gates. 2 gates have open access holes (for mains connections) and 2 have “knock-outs” (for control voltage connections). The access holes and “knockouts” are dimensioned for 20mm diameter cable glands (not provided). The gates can also be removed for alternative cable access solutions (eg: HAF).
• The housing of the LRC1020 can be screw mounted against a wall or ceiling. It can also be fixed against cable duct mounting plates (eg: van Geel). A clamping bracket to fix the housing against a mounting plate has to be ordered separately.
• The LRC1025 is the version with a DIN-rail housing. This type of housing is intended for standard 35mm DIN rail mounting in mains installation cabinets.
Applications

• The LRC1020 and LRC1025 offer a lighting control solution for applications with dimmable luminaires. Applications can range from “handsfree” switching in e.g. corridors and staircases (movement detector only) to “energy saving” solutions combined with (or without) IR remote control operation in single or open-plan offices (with IR receiver, movement detector and/or light sensor). Possible combinations of sensors are listed under “Miscellaneous”.

• Lights can be controlled according to:
  • manual light switching and regulation with an infrared receiver and transmitter.
  • manual light switching and regulation with standard pushbuttons connected to the LCU8020 pushbutton interface unit.
  • manual light switching with a push-button connected to the digital input (‘toggle’ switching) and/or regulation with a potentiometer;
  • automatic light switching and regulation by a light sensor which monitors the ambient light level,
  • automatic light switching by a movement detector which monitors the occupancy in a defined area.

• Sensor cables are used to connect sensors to the light controllers or to increase the distance between the sensor and controller (max.=30m).

• The sum of sensor cable lengths may not exceed 125m with up to two TRIOS units linked together; 100m with 3 or 4 TRIOS units and 85m with 5 TRIOS units.

• A functional control programme in TRIOS determines how the lights are switched and regulated. The connected sensor configuration automatically determines the selected control programme.

• Nearly all of the sensor parameters within this control programme are fixed. However, the following 4 parameters can be changed if an IR receiver or potentiometer is connected:
  • the group and channel address (with the OmniProg IRT8099/10),
  • stored preset values using the IRT8080 transmitter,
  • the reference level for a light sensor (by regulating lights up or down with IR remote control or a potentiometer),
  • Sensor signals to one controller can be passed to a maximum of four other controllers by interlinking the controllers via the modular input sockets. A limited number of sensors can therefore control larger loads (up to 25A). Each controller has to be connected to mains and luminaires. Also the storage and recall of (up to 4) lighting scenes is possible in this configuration.

Functionality

Address programming

The group and channel addresses of the TRIOS can be changed using the OmniProg IRT8099/10. As programming must be a selective action, the TRIOS programming tool has a reduced IR radiation and must be carefully pointed at the relevant receiver. Each successful programming action is confirmed by TRIOS by a short flash of the connected lights.

Sensors

General.

TRIOS detects which sensors are connected and activated, and automatically adapts its functionality to the found configuration. The table below gives a full survey for the various sensors and their combinations.

Push-button interface

In stead of, or in combination with, the infrared receiver, the pushbutton interface LCU8020 can be connected. Push-buttons connected to the LCU8020 can be given the same functions as the infrared transmitters, but also other combinations are possible. Maximum 19 pushbuttons can be connected. Functions realised in this way follow the rules for the infrared receiver as listed in the table below. For instance: dimming of channels and the selection of presets is disabled if a potentiometer is connected.

Light Sensor

The maintained lux level on a working surface is defined by the Reference Level in the LRC1020/25 (factory setting corresponds to 4 volts on the Light sensor input). TRIOS continuously regulates up or down (depending on available daylight) to keep the lux level equal to the selected Reference Level. The Reference Level can be increased or decreased using infrared remote control or by a potentiometer. With infrared remote control, the lights are dimmed up or down and the so obtained new light level (sum of daylight and artificial light) becomes the new Reference Level. Using the IRT8030 infrared transmitter, up to four different Reference Levels can be stored in (and recalled from) the memory of TRIOS as preset values at any time. With the potentiometer, the Reference Level is changed directly and it may take some seconds for the lights to adjust to the new Reference Level. With a Light Sensor installed, TRIOS will always switch on at 100% light output and then dim down to match the Reference Level. TRIOS will switch off when the measured lux level remains above 1.5 x the Reference Level for more than 15 minutes.

Notes:

• When a Reference Level is set too high (corresponding to more than 6.6Vdc at the light sensor input), the switch-off level (> 10Vdc at the light sensor input) cannot be reached.

• When the light sensor is used without an infrared receiver or a potentiometer, the (default) lux level on a working surface will be 600 lux when the average surface reflection coefficient in the room is 30%. Other lux levels are obtained with different reflection coefficients.

• When no IR receiver or push-button is connected, the desired lux level can be changed by adjusting the light sensitivity of the sensor.
### Effects of Sensors

<table>
<thead>
<tr>
<th>Sensors</th>
<th>Switch-On</th>
<th>Trios Functions</th>
<th>Up / Down</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infrared Receiver</strong></td>
<td>pre-defined light level - preset. (pre-defined reference level, if light sensor installed) disabled if:</td>
<td>all channels</td>
<td>per channel</td>
</tr>
<tr>
<td></td>
<td>- potentiometer installed previous light level - per channel. (current reference level, if light sensor installed)</td>
<td>lighting level - per channel (reference level, if light sensor installed) disabled if:</td>
<td>lighting level - per channel (reference level, if light sensor installed) disabled if:</td>
</tr>
<tr>
<td><strong>Movement Detector</strong></td>
<td>automatic</td>
<td>automatic</td>
<td>n.a.</td>
</tr>
<tr>
<td></td>
<td>when area becomes occupied disabled if:</td>
<td>when area is unoccupied for longer than the defined delay time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- IR Receiver installed.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- push-button installed</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Light Sensor detects daylight level higher than reference level.</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Light Sensor</strong></td>
<td>automatic automatic automatic</td>
<td>when measured lux level remains above 1.5x reference level for more than 15 minutes</td>
<td>maintains reference level</td>
</tr>
<tr>
<td></td>
<td>when daylight level drops below reference level disabled if:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- IR remote control or push-button is installed without Movement Detector</td>
<td>1,2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- lights were previously switched-off by IR remote control,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pushbutton or Movement Detector</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Movement detector detects an un-occupied area</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Manual Potentiometer</strong></td>
<td>n.a.</td>
<td>n.a.</td>
<td>light level</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(reference value, if light sensor installed)</td>
</tr>
<tr>
<td><strong>Push-button (&quot;toggle&quot;)</strong></td>
<td>previous light level - per channel. (current reference value, if light sensor installed)</td>
<td>per channel</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

#### Application aspects:

1. As energy saving has the highest priority, TRIOS will never switch-on the lights automatically if manual control (IR remote control or push button) is installed.
2. As an exception to this rule, the lights are automatically switched-on if daylight levels become too low after lights were previously switched-off due to sufficient daylight. During this period of sufficient daylight the area must remain occupied and the lights may not be switched-off by manual control.
3. Without manual control, lights are switched-on automatically, but only if daylight is insufficient.
4. Without manual control, lights are switched-on automatically, but only if the area is occupied.
5. For security applications and for daylight linking with conventional mains switching, the Light Sensor can be used (alone or combined with a potentiometer) without any further sensors installed. In this case the digital input must be short-circuited. (this short circuit must be in place before TRIOS is connected to mains). WARNING: if, besides the light sensor, other sensors are connected and active, make sure the digital input is NOT short-circuited, in order to avoid unexpected and illogical system reactions.
Electrical connections and Wiring Diagram

Notes
- the LRC1025 has the same wiring diagram
- check the earthing requirements of connected lighting loads A
- an earth loop-through is provided in the LRC1020 to facilitate installation
Switching and regulating the LRC1020/1025 with default control parameters

![Diagram showing connections and configurations]

**Technical data**

**Environmental conditions**

**Operating conditions**
- Temperature: 5 °C to 55 °C
- Rel. humidity: 15% to 90%, no condensation

**Storage conditions**
- Temperature: -40 °C to +70 °C
- Rel. humidity: 5% to 95%

**Mains input**
- LRC1020/10: 230 Vac ± 10 %; 50 Hz/60 Hz ± 5 %
- LRC1020/12: 120 Vac ± 10 %; 50 Hz/60 Hz ± 5 %
- 3.2 VA without sensors, 4.2 VA with sensors
- Cos φ: 0.87

**Switching output**
- LRC1020/10: 1150 VA, any type of lighting load LRC1025/10: 1150 VA, any type of lighting load
- LRC1020/12: 700 VA, any type of lighting load

**Regulating output**
- 1-10 Vdc; current sinking (max. 25 mA)

**Digital input**
- Active low, (push-buttons for "toggle" switching must be suited for 5-volt switching)

**Analogue input**
- 1-10 Vdc; current sourcing (max. 1 mA) for a current sinking potentiometer

**Connections terminals**
- Screw terminals are suited for solid or stranded wires with a cross-section of 0.5 to 2.5 mm²

**Sensor interface**
- Infrared signal protocol: RC5; IR address: group A-G / channel 1-5 (programmable, factory setting: A1); factory adjusted preset values: P1=15%, P2=40%, P3=60%, P4=100%; preset value can be changed with the IRT8030 transmitter and LCU8020 pushbutton interface.

**Light sensor**
- Switch on level: 4 Vdc; switch off level: 6 Vdc; switch off delay time=15 min.

**Movement detector**
- Switch off delay time: 0 min. (timer inside movement detector)

**Power supply for sensors**
- +5 Vdc ± 5%; 9 mA (infrared receivers)
- +12 Vdc ± 10%; 50 mA (movement detectors, light sensors and pushbutton interface unit)

**Connections**
- 1 modular socket for a RJ-12 (6p/6c) modular plug

**Notes**

A. Philips HF/regulating ballasts (>42 kHz) for fluorescent lamps and/or dimmers (LRD8000, LRD8010) for GLS lamps and/or halogen lamps
B. Branching connector (LCC8024)
C. Sensor cables with modular plugs and sockets (LCC8012 or LCC8013)
D. Sensors cables with modular plugs at both ends (LCC8014)
E. Interlink cable (LCC8011)
Mounting
LRC1020  2 open-ended slots and 2 holes for 4mm diameter screws; 4 stubs on base plate fit in mounting plate slots (clamping bracket required)
LRC1025  suited for mounting on a 35mm DIN rail inside a mains installation cabinet or similar

Weight
LRC1020  460 gr.
LRC1025  325 gr.

Safety
Housing  protection class IP 20
Flammability class  V0
Glow wire test  960 °C
Insulation sensor part  the sensor; digital, analogue and programming inputs have double insulation (4 kV) towards mains and have basic insulation (2 kV) towards the regulating output.
regulating output  the regulating output has double insulation (4 kV) towards mains and has basic insulation (2 kV) towards the sensor part

Sensor cables  cables comply with signal wire rules.
Ballast/dimmers:  connected dimmers and regulating ballasts shall have a least basic insulation.

Safety compliance  IEC 669-2
EMC compliance  Immunity  EN 61547
Emission  EN 55015

Packing data

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<tr>
<th>Type</th>
<th>Box dimensions (mm)</th>
<th>Qty</th>
<th>Material</th>
<th>Weight (Kg)</th>
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<td></td>
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<td>net</td>
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<tr>
<td>LRC1020/20</td>
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<td>card board</td>
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<td>card board</td>
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Ordering Data

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<th>EAN code level 1</th>
<th>EAN code level 3</th>
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<td>LRC1020/20 CONTR 1x1 ST SW&amp;RE</td>
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<td>LRC1025/20 CONTR 1x1 DIN SW&amp;RE/10</td>
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<td>731988 99</td>
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