USER MANUAL

Longo programmable controller
LPC-2.IR1V
Infrared Receiver module

Version 1

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User Manual

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STANDARDS AND PROVISIONS: Standards, recommendations, regulations and provisions of the country in which the devices will operate, must be considered while planning and setting up electrical devices. Work on 100 .. 240 V AC network is allowed for authorized personnel only.

DANGER WARNINGS: Devices or modules must be protected from moisture, dirt and damage during transport, storing and operation.

WARRANTY CONDITIONS: For all modules LONGO LPC-2 – if no modifications are performed upon and are correctly connected by authorized personnel – in consideration of maximum allowed connecting power, warranty of 24 months is valid from the date of sale to the end buyer, but not more than 36 months after delivery from Smarteh. In case of claims within warranty time, which are based on material malfunctions the producer offers free replacement. The method of return of malfunctioned module, together with description, can be arranged with our authorized representative. Warranty does not include damage due to transport or because of unconsidered corresponding regulations of the country, where the module is installed.

This device must be connected properly by the provided connection scheme in this manual. Misconnections may result in device damage, fire or personal injury.
Hazardous voltage in the device can cause electric shock and may result in personal injury or death.
NEVER SERVICE THIS PRODUCT YOURSELF!
This device must not be installed in the systems critical for life (e.g. medical devices, aircrafts, etc.).

If the device is used in a manner not specified by the manufacturer, the degree of protection provided by the equipment may be impaired.

Waste electrical and electronic equipment (WEEE) must be collected separately!

LONGO LPC-2 complies to the following standards:

- EMC: EN 61000-6-3:2007 + A1:2011, EN 61000-6-1:2007, EN 61000-3-2:2006 + A1:2009 + A2: 2009, EN 61000-3-3:2013
- LVD: IEC 61010-1:2010 (3rd Ed.), IEC 61010-2-201:2013 (1st Ed.)

Smarteh d.o.o. operates a policy of continuous development. Therefore we reserve the right to make changes and improvements to any of the products described in this manual without any prior notice.

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1 ABBREVIATIONS

IR	Infra-Red
RC	Remote Control

2 DESCRIPTION

LPC-2.IR1V is infra-red (IR) transceiver module. It enables remote controlling of various devices connected to LPC configuration. Module accepts commands from remote control unit (RC) and forwards them to the controller. It is then the application, loaded in the main module, where logic is carried out (e.g. button “Up” triggers light dimming).
Module communicates to the controller by RS-485 protocol.

Module features additional RS-232 port for communication with PC. This port enables binding and storing desired IR commands (buttons) to application variables when custom behavior is needed. For further information on adapting preprogrammed actions contact manufacturer.
Switching between the two ports is done automatically by the circuit and requires no user interaction.

Module works with universal remote control unit which support Infra-red Protocol Sanyo 7461 (carrier: 38 kHz, coding: Pulse-position modulation).

Power is supplied from LPC-2.MC7 controller through RS-485 cable, therefor no additional power supply is needed.

3 FEATURES

Figure 1: LPC-2.IR1V module.

Table 1: Features
Programmable IR Transceiver
Compatible with universal remote control unit
Provides additional direct connection with PC (RS-232)
Store for 15 different predefined keys (codes)
DIP switch configurable RS-485 address
Status LEDs for IR and RS-485 communication
Modular frame mounting

4 INSTALLATION

4.1 Connection scheme

Figure 2: Connection scheme

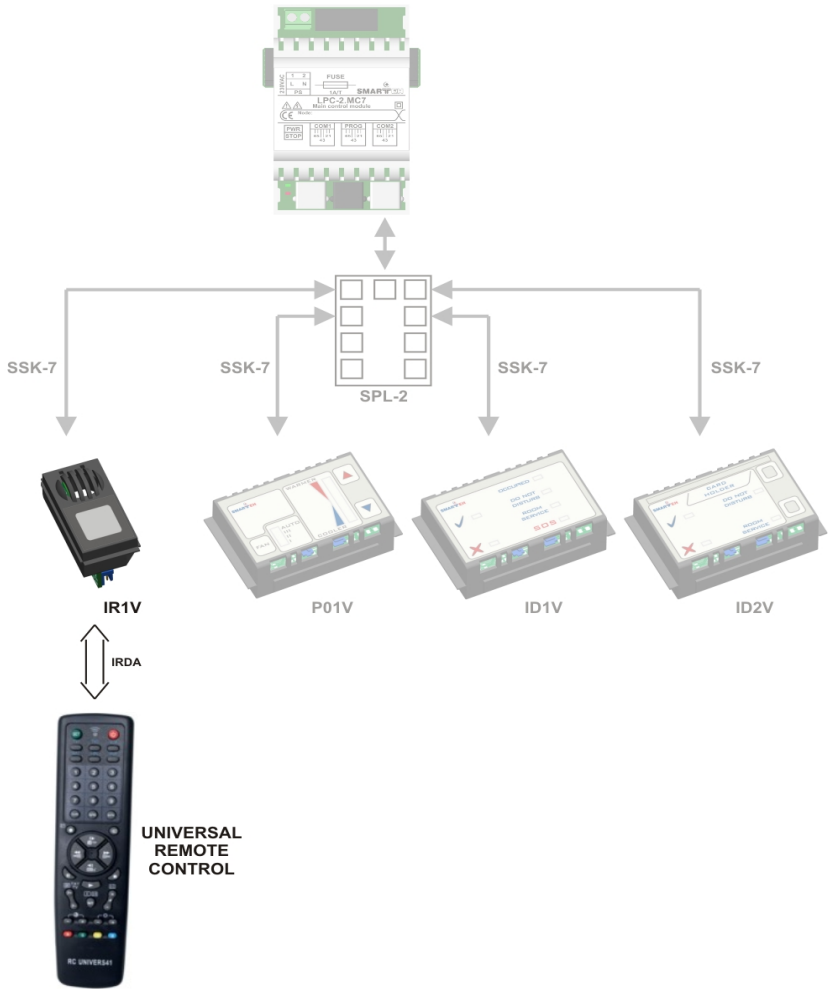


Figure 3: Layout of LEDs, Pushbuttons, connectors

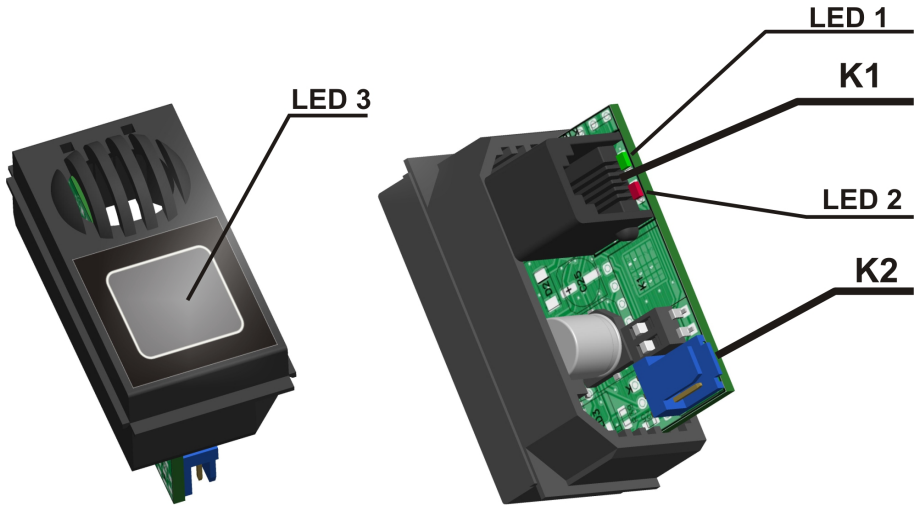


Table 2: K1

K1.1	GND	Ground
K1.2	9 V DC	Power supply input
K1.3	Standard RS-485 A	Data receive/send line A
K1.4	Standard RS-485 B	Data receive/send line B

Table 3: LEDs & Buttons

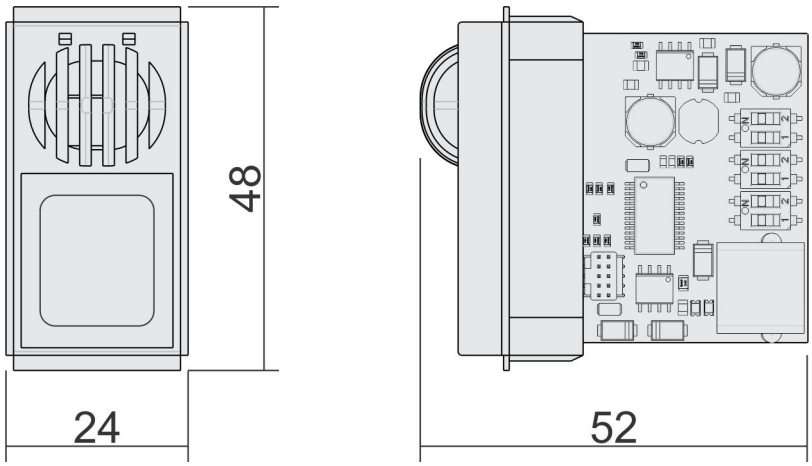
LED1	Rx Serial comm. status color: green	On: RS-485 data receive Off: no data present
LED2	Tx serial comm. status color: tree	On: RS-485 data transmit Off: no transmit
LED3	IR comm. status color: orange	On: correct IR request present Off: no IR request/incorrect IR request

Table 4: S1

RS-485 ADDRESS	Switch 1	Switch 2
0	OFF	OFF
1	OFF	ON
2	ON	OFF
3	ON	ON

4.2 Mounting instructions

Figure 3: Housing dimensions



Dimensions in milimeters.

All connections, module attachments and assembling must be done while module is not connected to the main power supply.

The LPC-2.P01 module should be positioned on the wall inside the room. It is advised to avoid direct sunlight or position near heating/cooling source object. Round flush-mounting box (e.g. Gewiss GW 24232), Φ60 mm is recommended for installation. A box must be installed with screw holes in the horizontal position!

Mounting instructions:

1. Mount LPC-2.P01 module back plate to the provided leveled place on the wall.
2. Fasten 2 screws (DIN 7981 or similar, Φ3 mm, **max. head height 3 mm**) to fix LPC-2.P01 module to its place.
3. Connect interconnection cable to the interconnection connector K1. Max. allowed tractive force is 30 N.
4. Set the correct RS-485 address (S1 switch) for LPC-2.P01 (refer to the Table 4).
5. Power (PWR) green LED should switch on according to the Table 5.
6. Mount LPC-2.P01 module front plate to the back plate.
7. Fasten the screw in the bottom carefully (not too strong), to fix the front plate to the back plate.

5 HOW TO USE

5.1 Addressing

Depending on number of additional devices attached to 485 port of main module, corresponding address must be set properly as advised by LPC Composer application. Address is set using DIP switches on the back side of module. Refer to Table 4 for finding the corresponding position of slides advised by LPC Composer. When address is changed, device must be disconnected from the power supply and then reconnected again for changes to take effect. After successful address configuration, device is ready to communicate with controller.

5.2 Receive mode

In this mode the device accepts commands from remote control unit and forwards them to the controller over RS-485 network.

By default the following buttons on universal remote are recognized by the device: numerical buttons from 0 to 9, program up and program down buttons, reverse and forward buttons and power button. Actions on these buttons are mapped to the LPC Composer variable in the way that is shown in the following table.

Table 5: Button mapping

Remote control	Default variable name*
Numerical button 1	IR1V_x_NUM_1
Numerical button 2	IR1V_x_NUM_2
Numerical button 3	IR1V_x_NUM_3
Numerical button 4	IR1V_x_NUM_4
Numerical button 5	IR1V_x_NUM_5
Numerical button 6	IR1V_x_NUM_6
Numerical button 7	IR1V_x_NUM_7
Numerical button 8	IR1V_x_NUM_8
Numerical button 9	IR1V_x_NUM_9
Numerical button 0	IR1V_x_NUM_0
Power on/off button	IR1V_x_PWR
Program up button	IR1V_x_P_UP
Program down button	IR1V_x_P_DOWN
Reverse button	IR1V_x_REV
Forward button	IR1V_x_FWD

* … letter “x” can be any valid RS-485 address (number between 0 and 3)

When a button is pressed on the remote, corresponding variable is set and send to the controller. If

the communication is successful, the variable is automatically cleared after the answer is received from controller.

If a button is pressed and held, corresponding variable is set and remains set until the button is released.

Beside actual buttons state IR transceiver also sends some other data to controller.

Table 6: Other sent/received data

Data	Default variable name
Heart bit	IR1V_x_HEART
IR Code	IR1V_x_IR_CODE
IR Data	IR1V_x_IR_DATA

Heartbeat bit is reserved for checking that the device is still communicating correctly with the controller (bit toggles on/off every successful communication cycle with controller).

IR Code is the code received from remote control unit.

IR Data describes which button was pressed on the given remote control unit.

IR transceiver accepts commands from remote control unit only if IR Code and IR Data both match with the code and data stored in transceiver's EEPROM. When command is accepted, red LED is lit for a short period of time.

5.3 Transmit mode

In this mode the device can transmit data over IR communication to some other IR receiver. Data to be transmitted must be present on variables IR1Vx_IR_CODE and IR1Vx_IR_DATA. Data is sent only if both variables are different than zero. Same data is sent over and over again, until at least one of these two variables is equal to zero.

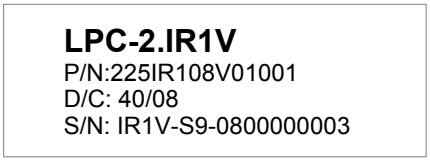
5.4 Universal Remote control unit programming

The easiest way to program the remote control unit to work with IR transceiver is to start the automatic search mode (refer to your remote control unit user manual for instructions on how to do this) and point the remote in the direction of IR transceiver. Automatic search will try to communicate with IR transceiver using all possible protocols. When the correct protocol is used, red LED on the IR transceiver lits up (otherwise the LED is off). At that time, stop the auto search and store the last used protocol so that it will be used for all further communication.

The other way is to manually enter the correct code in the remote control unit. Search your remote control unit user manual for protocol code which corresponds to general Samsung DVD device. Enter that code in the remote and the unit should start communicating with IR transceiver.

6 MODULE LABELING

Figure 5: Labels



Label description:

- **LPC-2.IR1V** is the full product name.
- P/N: 225IR108V01001 is the part number.
  - 225 – general code for LPC-2 product family,
  - IR1 – short product name,
  - 08 – year of code opening,
  - V - denotes flush frame mounting module,
  - 01 – derivation code,
  - 001 – version code (reserved for future HW and/or SW firmware upgrades).
- D/C: 40/08 is the date code.
  - 40 – week and
  - 08 – year of production.
- S/N: IR1V-S9-0800000003 is the serial number.
  - IR1V – short product name,
  - S9 – user code (test procedure, e.g. Smarteh person xxx),
  - 08 – year (last two cyphers),
  - 00000003 – current stack number; previous module would have the stack number 00000002 and the next one 00000004.

7 TECHNICAL SPECIFICATIONS

Table 5: Technical specifications	
Power supply	from main module
Interconnection connector type	RJ12 6/6
Power consumption	0.5 W
Dimensions (W x H x D)	24 x 48 x 34 mm
Weight	15 g
Maximum altitude	2000 m
Mounting position	all directions
Ambient temperature	0 to 50 °C
Ambient humidity	max. 95 %, no condensation
Transport and storage temperature	-20 to 60 °C
Protection class	IP 20

8 CHANGES

The following table describes all the changes to the document.

Date	V.	Description
28.2.2008	001	The initial version, issued as *LPC-2.IR1V special module UserManual*.

9 NOTES