



**SMARTEH**<sup>®</sup>  
LIVING SYSTEMS

# USER MANUAL

- ▶ Longo programmable controller  
LPC-2.CR2  
Card Reader module

Version 4

Written by SMARTEH d.o.o.  
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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 (3<sup>rd</sup> Ed.), IEC 61010-2-201:2013 (1<sup>st</sup> 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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**Longo programmable controller LPC-2.CR2**

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## 1 ABBREVIATIONS

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Sorted by order of appearance in document:

RFID	Radio frequency identification
SOS	Emergency call
LED	Light emitting diode
DIP	Dual in-line package
ID	Identity

## 2 DESCRIPTION

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LPC-2.CR2 RFID reader is intended to be used as an identity verification device for outdoor mounting.

When RFID tag (key-card) is approached to the reader and its code is successfully read out, the green LED blinks and a short beep is generated. In case key-card for correspondent room is valid, the green LED blinks again and a short beep is generated. Other devices can be activated at this event like door lock opening, turning light on... If key-card number is not valid, the red LED blinks and a longer beep is generated.

Functionalities are controlled from main module. Controller is accompanied with Smarteh IDE application. It is a tool, where various modules can be put together to a configuration, based on number and type of electrical signals needed. Smarteh IDE takes care for proper modules position. Latest Smarteh IDE setup can be downloaded from Smarteh web page support section:  
[www.smarteh.si/Support/Downloads/Software/Development\\_tools](http://www.smarteh.si/Support/Downloads/Software/Development_tools)

LPC-2.CR2 module can be modified on customer request: custom front label, push buttons added, LEDs added. For more information please contact manufacturer.

### 3 FEATURES

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Figure 1: LPC-2.CR2 module.

**Table 1: Technical data**

RFID reader
OK “ ✓ ” LED
Fault “ X ” LED
Power LED
Internal fault LED
Internal built-in buzzer
IP65 housing for outdoor mounting
Black or white glass possibility

## 4 OPERATION

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Operation of the CR2 module is also dependent on parameters received on RS-485 communication channel.

Reader RFID field is active always when module is powered up. If tag is put inside RFID field, reader tries to resolve RFID tag code. If code is read successfully, module activates status *iDNew*, generates a short beep, OK LED1 blinks and code is transmitted in *iDW1* - *iDW3* status fields. In main module application this code can be read out and authenticated. If code has appropriate rights, main module should activate *oOK* command. If code is not authorized, main module application should activate *oFault* command. Regarding command received, following actions are triggered on module:

*oOK* --> OK LED2 blink, short beep.  
*oFault* --> Fault LED1 blink, long beep.

Either command is received or no command is received within 10 sec, module clears *iDNew* status and waits for next RFID tag. While CR2 module is waiting for authorization response, new RFID tags can not be read.

### 4.1 Parameters

If parameter is set to logical “1”, is considered to be active, enabled or set. If parameter has logical value “0” is considered to be inactive, disabled, or cleared.

Parameter can be feedback or command. Parameter as feedback means that CR2 module is sending information to main module. On the other hand, command represents request from main module to module.

*Command:*

**ID Fault [*oFault*]:** Command for rejecting authorization of RFID code.

**ID OK [*oOk*]:** Command for authorization of RFID code.

**Buzzer [*oBuzz*]:** While this command is active, buzzer is active.

**'Fault' ID LED [*oFaultLD*]:** While this command is active, fault LED1 is set.

**'OK' ID LED [*oOkLD*]:** While this command is active, OK LED2 is set.

**Card Type Selection [*oSelTyp*]:** 0 → Emarine; 1 → hitag.

*Feedback:*

**RFID ID receiv. Word1 (s) [*iDW1*]:** Upper (most significant) third of RFID code.

**RFID ID receiv. Word2 (s) [*iDW2*]:** Middle third of RFID code.

**RFID ID receiv. Word3 (s) [*iDW3*]:** Lower (least significant) third of RFID code.

**New ID [*iDNew*]:** When new RFID tag is recognized, this status is set active for 10sec or till authorization command is received (*oOK* or *oFault*).

**Communication [*iComm*]:** Normal state is “0”. If set, there is communication error or no communication established.

**'Up-right' TB [*iUpRTB*]:** signal from button located up-right corner (this button is disabled by default and can be enable in EPROM).

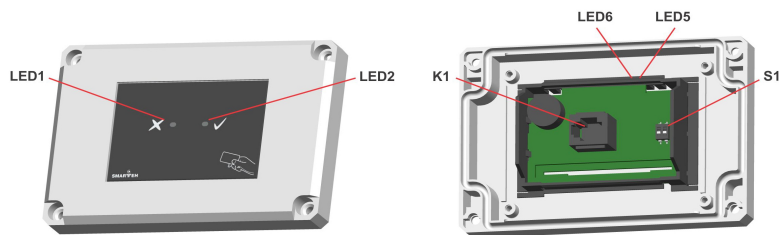
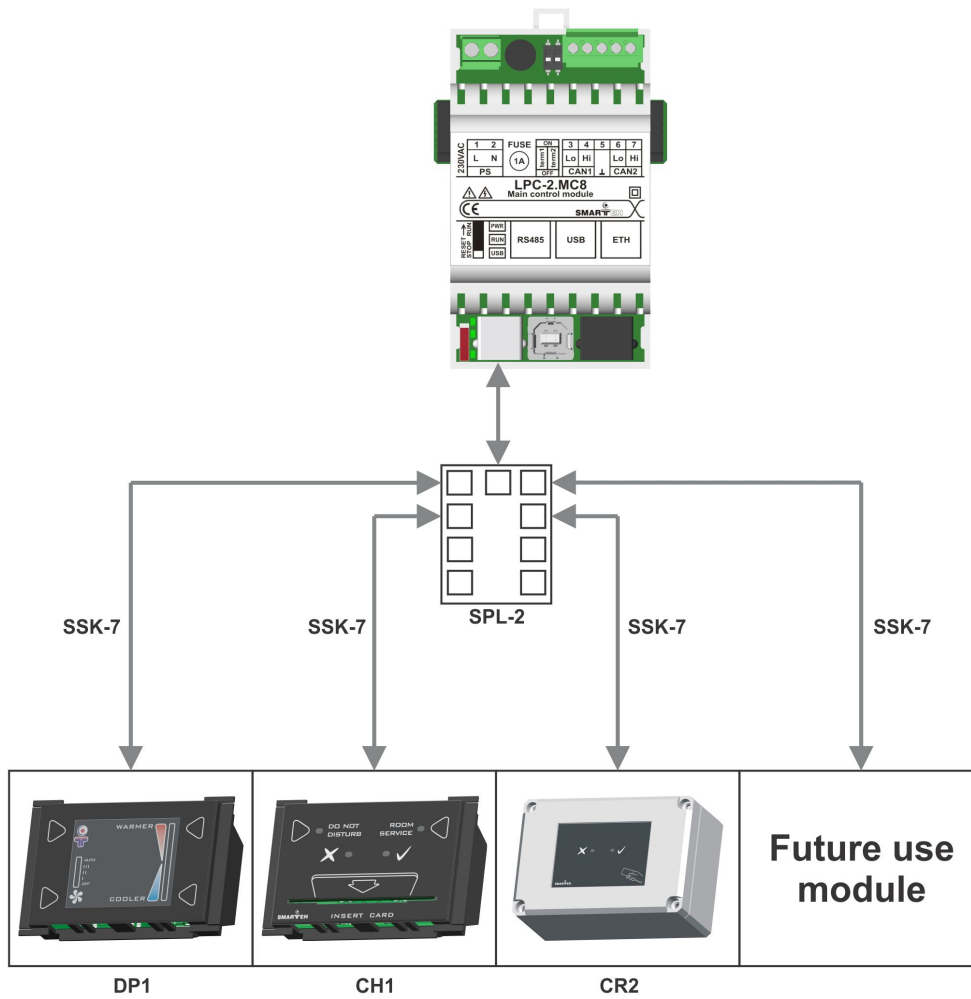
**'Up-left' TB [*iUpLTB*]:** signal from button located up-left corner (this button is disabled by default and can be enable in EPROM).



## 5 INSTALLATION

### 5.1 Connection scheme

Figure 2: Connection scheme



**Table 2: K1**

K1.1	GND	Ground
K1.2	10 .. 24 V DC	Power supply input
K1.3	RS-485 A	Data receive/send line A
K1.4	RS-485 B	Data receive/send line B

**Table 3: LEDs & Buttons**

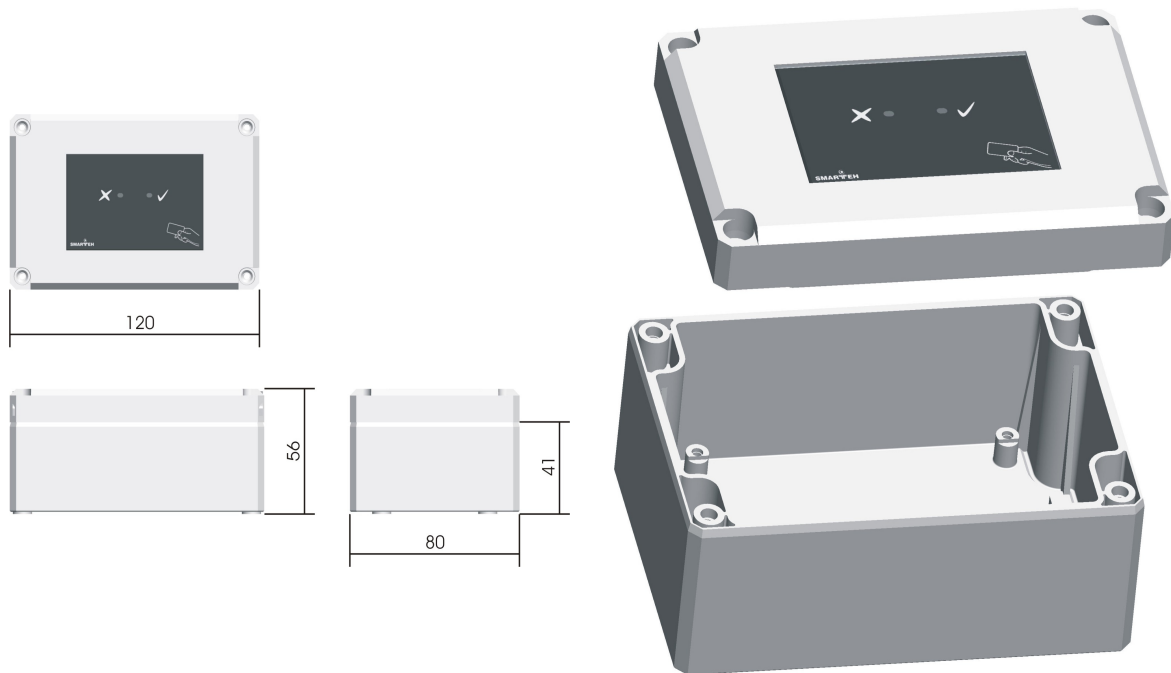
LED1: red	Fault “ X ”	ON: RFID key standard NOK or ID card number wrong OFF: No tag in proximity
LED2: green	OK “ √ ”	ON: RFID key standard OK and ID card number valid OFF: No tag in proximity
LED5: red	Communication	ON: RS-485 communication fault OFF: RS-485 communication OK
LED6: green	Power supply	ON: power supply OK OFF: power supply missing or power off

**Table 4: S1**

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

## 5.2 Mounting instructions

**Figure 3: Housing dimensions**



Dimensions in millimeters.



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

Several RFID panels should not be mounted close to each other. Minimum distance to next panel is at least 30 cm. This restriction also applies in case of mounting panels on both sides of the same wall. Adequate shielding material and provisions could be used to avoid interference between panels.

RFID panel should not be positioned close to conductive areas.

1. Set the correct RS-485 address (S1 switch) for LPC-2.CR2 (refer to the Table 4).
2. Drill a hole for cable inlet on desired side and position of the module. Be aware to use proper IP class inlet to insure that module will still be resistant to desired level.
3. Connect interconnection cable to the connector K1. Max. allowed tractive force is 30 N.
4. Mount LPC-2.CR2 module on provided
5. Cover LPC-2.CR2 with cover plate

LPC-2.CR2 connects to the main module unit on its RS-485 port using interconnection cable. When more special modules (e.g. LPC-2.CA1, LPC-2.CH1, LPC-2.DP1) are connected to main module, splitter is also required (e.g. SPL-2). Signal wires must be installed separately from power and high voltage wires in accordance with general industry electrical installation standard.

### 5.3 Module labeling

**Table 5: Labels on housing**

Label 1 (sample):

**LPC-2.CR2**  
 P/N:225CR210V01001  
 D/C: 01/10

Label 2 (sample):

S/N: CR2-S9-1000000003

**Label 1 descriptions:**

1. **LPC-2.CR2** is the full product name.
2. **P/N: 225CR210V01001** is the part number.
  - **225** - general code for product family,
  - **CR2** - short product name,
  - **10V01** - sequence code,
    - **10** - year of code opening,
    - **V** - denotes flush frame mounting module,
    - **001** - derivation code,
  - **001** - version code (reserved for future HW and/or SW firmware upgrades).
3. **D/C:01/10** is the date code.
  - **01** - week and
  - **10** - year of production.

**Label 2 descriptions:**

1. **S/N: CR-S9-1000000003** is the serial number.
  - **CR2** - short product name,
  - **S9** - user code (test procedure, e.g. Smarteh person xxx),
  - **1000000003** - year and current stack code,
    - **10** - year (last two cyphers),
    - **00000003** - current stack number; previous module would have the stack number 00000002 and the next one 00000004.

## 6 TECHNICAL SPECIFICATIONS

**Table 6: Technical specifications**

Power supply	from main module
Interconnection connector type	RJ-12 6/6
Power consumption	1.5 W
RFID type	EM4100, 125 kHz, Manchester 64, read only
Max. reading distance	4 cm
Dimensions (W x H x D)	120 x 80 x 60 mm
Weight	200 g
Ambient temperature	0 to 50 °C
Maximum altitude	2000 m
Mounting position	any
Transport and storage temperature	-20 to 60 °C
Protection class	IP 65

## 7 SPARE PARTS

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For ordering spare parts following Part Numbers should be used:

LPC-2.CR2 Card Reader module	
LPC-2.CR2, EM, black	P/N: 225CR210V01001
LPC-2.CR2 Card Reader module	
LPC-2.CR2, EM, white	P/N: 225CR216V03W03
LPC-2.MC8 Main module	
LPC-2.MC8	P/N: 225MC813001001
Splitter	
SPL-2 (1/8)	P/N: 206SPL04002001
Interconnection cable	
ICM-x	P/N: 203ICMxxxxxxxxx

## 8 CHANGES

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The following table describes all the changes to the document.

Date	V.	Description
07.06.2016	4	General update.
01.06.2014	3	Power consumption data update.
01.07.2012	2	CGP General update.
18.03.2010	1	The initial version, issued as <i>LPC-2.CR2 module UserManual</i> .

## 9 NOTES

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