



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

# USER MANUAL

- ▶ Longo programmable controller  
LPC-2.WP2H  
Wireless Temperature Control  
panel

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.WP2H

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## 1 ABBREVIATIONS

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SP	Set point
PB	Push button
LCD	Liquid crystal display
DIP	Dual in-line package
WM-BUS	Wireless M-Bus



## 2 DESCRIPTION

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LPC-2.WP2H wireless panel is used for room temperature monitoring. Panel is equipped with temperature, relative humidity and light intensity sensor and four push buttons (PB). Data are displayed on low power monochromatic LCD.

To increase/decrease temperature set point (SP) *warmer*, *cooler* PB should be pressed respectively. Temperature SP is represented on the right side of the LCD with a bar-graph.

LPC-2.WP2H control panel offers few user customization options that can be defined before installation in the service mode. Users can enable or disable displaying of some LCD elements like battery sign, actual temperature, actual relative humidity and real time clock (HH:MM). Disabling LCD element in service mode will override the enabling LCD element command from the main module. Service mode must only be entered by a qualified technician.

LPC-2.WP2H can display actual temperature value up to  $\pm 0.3$  °C accuracy and  $\pm 2$  % for relative humidity. Enabling can be done by main module enable commands.

Settings made on main module are updated and visible on wireless panels (e.g., LPC-2.WP1H, LPC-2.WP2H and LPC-2.WT1) after regular data update period (approximately 15 minutes) or immediately after some of feedback parameters has changed (e.g., new temperature setpoint,...).

LPC-2.WP2H is powered from the two AA (LR6) battery.



### 3 FEATURES

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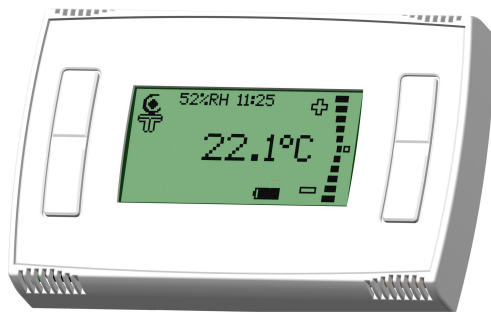


Figure 1: LPC-2.WP2H wireless temperature control panel.

Table 1: Features
Wireless temperature and humidity measurement
4 push buttons for temperature set point
10 position LCD bar-graph for temperature set point
Light intensity measurement for smart LCD on/off regulation
Up to 30 meters indoor signal range <sup>1</sup>

<sup>1</sup> Depends of the RF output signal configuration.



## 4 OPERATION

Pre installation setting and configuration is done during the assembly process. Users can set only basic settings with the DIP switch.

### 4.1 Operational modes

#### Service

Service mode is enabled every time the wireless panel is turned on and the panel is connected through special SMB cable to the wireless panel, thus allowing only to qualified technician to set parameters. LPC-2.WP2H will save the configuration parameters after service mode is exited via LPC Tester. This is done by setting Service mode to "0" in RAM2.

Service mode is enabled for 3 sec. after power up. If service mode is not triggered using Smarteh LPC Tester, then wireless panel will start in normal mode.

#### Normal

When exiting the service mode wireless panel goes into normal mode, trying to connect to the wireless adapter LPC-2.WA1. If connection is established the LCD should display data according to display setting. Using four push buttons users can change temperature set-point. If the connection with the LPC-2.WA1 could not be established, the "NO RF LINK" sign will be displayed.

LPC-2.WP2H has a light intensity sensor turning on/off the LCD, and significantly reducing the power consumption. If the light is too low the LCD goes in off state. If light is increased or button is pressed, the LCD goes in on state.

Actual room temperature (0.5 °C resolution) is displayed on the screen if temperature LCD element is enabled.

First press on any PB will activate the display to "set mode" and LCD intensity will be put to maximum. No action regarding the pressed PB is done. Further pressings on any PB will make the change (bar-graphs) regarding the pressed PB.

#### Error

In case of wireless panel communication fault, "NO RF LINK" sign appear on LCD.

### 4.2 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, command or both. When parameter is marked as feedback it means that panel is sending information to the main module. On the other hand, command represents request from the main module to the wireless panel. Raw data is the digital value used in programming logic, which corresponds to the engineering data, e.g. value in °C, value in %RH, Physical unit,... Note that raw data may be scaled to get engineering data, e.g. raw data 10000 corresponds to 100.00 °C. Commands and feedbacks can be set in Smarteh IDE.

#### Command:

**°C/°F Temperature Unit [*oTempUnt*]:** Units of actual room temperature.

Type: BOOL

Raw to engineering data:        "0" → °F  
   "1" → °C

**Remote temperature [*oTRem*]:** Temperature value used instead of *iTAct*, if value





is different than 0.

Type: WORD

Raw to engineering data: 0 .. 10000 → 0.00 °C .. 100.00 °C

**Relative Hum. Display Num Enable [*oRhEn*]:** Enabling or disabling actual room relative humidity (%RH) element on the display.

Type: BOOL

Raw to engineering data: “0” → Disable %RH display

“1” → Enable %RH display

**Clock Display Enable [*oRTCEn*]:** Enabling or disabling clock element on the display.

Type: BOOL

Raw to engineering data: “0” → Disable clock display

“1” → Enable clock display

**Temp. Display Num Enable [*oTmpEn*]:** Enabling or disabling temperature element on the display.

Type: BOOL

Raw to engineering data: “0” → Enable temperature display

“1” → Disable temperature display

**Max. Temp. Set par. [*oTMax*]:** Denotes max. SP temp. which is scaled to the top of LCD temperature bar.

Type: WORD

Raw to engineering data: 0 .. 10000 → 0.00 °C .. 100.00 °C

**Min. Temp. Set par. [*oTMin*]:** Denotes min. SP temp. which is scaled to bottom of LCD temperature bar.

Type: WORD

Raw to engineering data: 0 .. 10000 → 0.00 °C .. 100.00 °C

**Remote Temp. Setp. [*oRTSet*]:** When *oRem* parameter is active, the *oRTSet* is used as SP.

Type: WORD

Raw to engineering data: 0 .. 10000 → 0.00 °C .. 100.00 °C

**Clock Set Value [*oRTCSet*]:** Real time clock (HH:MM) value by main module for display on wireless panel. Real time clock is reported using BCD code which must be converted to decimal. For example, 09:00 is 0000100100000000 (BCD) which is 2304 decimal.

Displaying is enabled with *oRTCEn* command bit.

Type: WORD

**Local/Remote command [*oRem*]:** When “0”, Local mode is selected. In this mode wireless panel uses set point set by TB. In remote mode, “1”, wireless panel uses set point received from other devices (HMI, Touch Panel, OT1,..) through communication channel.

Type: BOOL

Raw to engineering data: “0” → Local

“1” → Remote

**Feedback:**

**RH Display Num Enable [*iRHEn*]:** Status if the displaying Rh on display is enabled.

Type: WORD

Raw to engineering data: “0” → Disable

“1” → Enable

**Communication status [*iComm*]:** Indicated communication status.

Type: BOOL



Raw to engineering data: "0" → Communication fault  
 "1" → Communication OK

**Low Battery status [*iLowBat*]:** Indicated battery status.

Type: BOOL

Raw to engineering data: "1" → Low battery power  
 "0" → Battery OK

**Max. Temp. Set val [*iTMax*]:** Denotes max. SP temp. which is scaled to top of LCD temperature bar.

Type: WORD

Raw to engineering data: 0 .. 10000 → 0.00 °C .. 100.00 °C

**Min. Temp. Set val [*iTMin*]:** Denotes min. SP temp. which is scaled to bottom of LCD temperature bar.

Type: WORD

Raw to engineering data: 0 .. 10000 → 0.00 °C .. 100.00 °C

**Temp. Setpoint [*iTSet*]:** Actual set-point value.

Type: WORD

Raw to engineering data: 0 .. 10000 → 0.00 °C .. 100.00 °C

**Act. Room temp. [*iTAct*]:** Actual room temperature measured by wireless panel.

Type: WORD

Raw to engineering data: 0 .. 10000 → 0.00 °C .. 100.00 °C

**Act. Room RH. [*iRHAct*]:** Room humidity measured by wireless panel.

Type: WORD

Raw to engineering data: 0 .. 100 → 0 .. 100 %

**Act Light intensity [*iLight*]:** Actual light intensity measured by sensor on wireless panel. Light intensity measurement is for indication only.

Type: WORD

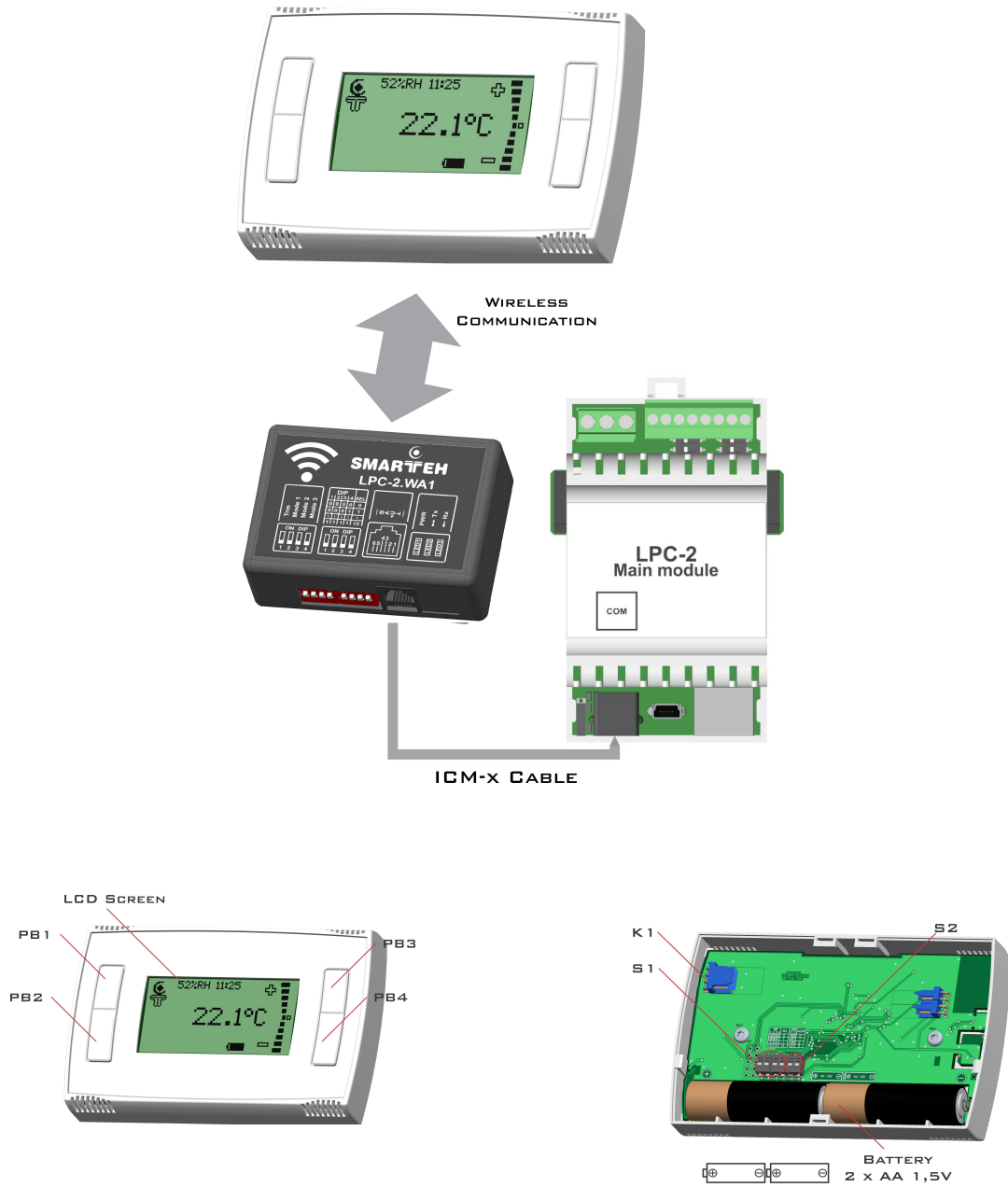
Raw to engineering data: 0 .. 10000 → dark .. bright



## 5 INSTALLATION

### 5.1 Connection scheme

Figure 2: Connection scheme to main module



**Table 2: K1**

K1.1	GND	Ground
K1.2	7 .. 16 V DC	Power supply input
K1.3	RS-232 Rx	Data receive line
K1.4	RS-232 Tx	Data transmit line

**Table 3: LCD screen symbols & Buttons**

Bar 1 LCD	Temp. SP	Active LCD bar presents actual set point relative to range <i>Min. temp.</i> (bottom LCD bar) - <i>Max. temp.</i> (top LCD bar)
PB1 (Up-left)	Temp. SP Up	Increase by one step
PB2 (Down-left)	Temp. SP Down	Decrease by one step
PB3 (Up-right)	Temp. SP Up	Increase by one step
PB4 (Down-right)	Temp. SP Down	Decrease by one step
Battery Icon		Indicate the battery status
Clock		RTC displayed

**Table 4: S1**

SUBNET	Switch 1	Switch 2	Switch 3	Switch 4
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
..	..	..	..	..
..	..	..	..	..
14	ON	ON	ON	OFF
15	ON	ON	ON	ON

**Table 5: S2**

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



## 5.2 Service mode

In service mode LPC-2.WP2H is connected to PC via Smarteh LSA-2.USB adapter. Connection between LPC-2.WP2H and LSA-2.USB is made with SMB programming cable which is connected to K1 connector on LPC-2.WP2H and RS-232 port on LSA-2 USB adapter. Service mode must only be entered by a qualified technician.



### 5.3 Mounting frame selection

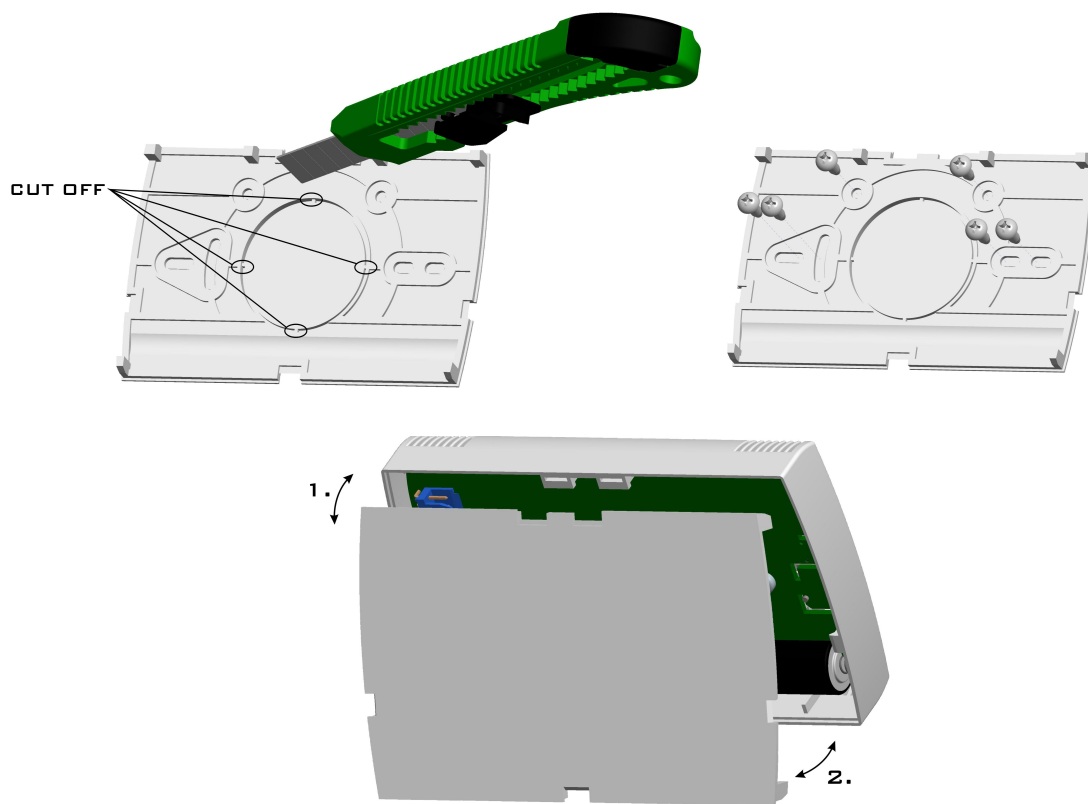
Wireless panel casing is designed to be used as remotely panel allowing users to move it or use it as a wall mounted panel on fixed place.

Wall mounting procedure:

- Cut off circular shape at the back of the case with the knife cutter,
- Use screws to mount on the mounting hole frame in the wall,
- Assemble the front panel.

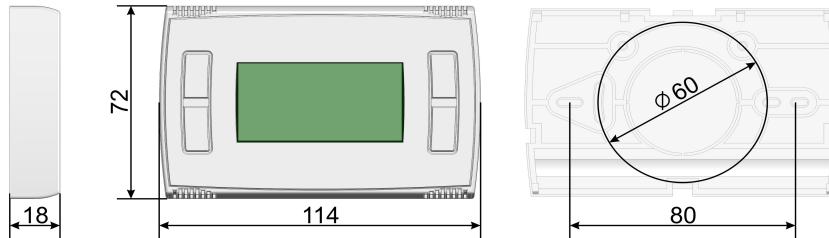
Panel housing has a groove in the back plate, which can be easily removed with knife cutter or pliers. This adaptation enables housing to be mounted and easy adjusted.

**Figure 3: Mounting instructions**



## 5.4 Mounting instructions

**Figure 4: Housing dimensions**



Dimensions in milimeters.



All connections, panel attachments and assembling must be done while panel is not powered.

Panel should be positioned in the wall inside of the room. Avoid direct sunlight or positioning near heating/cooling source object.

Panel is designed to be installed or placed vertically allowing air flow from bottom to top.

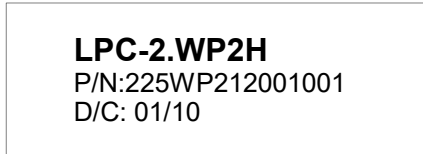
1. Set the correct subnet (S1 switch) and wireless panel address (S2 switch) inside LPC-2.WP2H (refer to the Table 4 and Table 5),
2. Mount the back plate in mounting frames (dose),
3. Insert 2x AA 1.5 V battery,
4. Attach front part of LPC-2.WP2H to the mounted back plate.



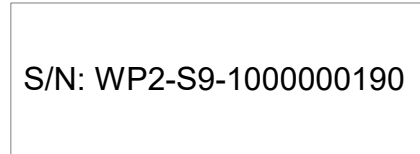
## 5.5 Module labeling

**Figure 8: Labels**

Label 1 (sample):



Label 2 (sample):



### *Label 1 descriptions:*

1. **LPC-2.WP2H** is the full product name.
2. **P/N: 225WP212001001** is the part number.
  - **225** - general code for product family,
  - **WP2** - short product name,
  - **12001** - sequence code,
    - **12** - year of code opening,
    - **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: WP2-S9-1000000190** is the serial number.
  - **WP2** - short product name,
  - **S9** - user code (test procedure, e.g. Smarteh person xxx),
  - **1000000190** - year and current stack code,
    - **10** - year (last two cyphers),
    - **00000190** - current stack number; previous module would have the stack number 00000189 and the next one 00000191.





## 6 TECHNICAL SPECIFICATIONS

**Table 6: Technical specifications**

Power supply	2pcs. AA (LR6) battery
Battery lifetime	Approximately 1.5 years
Operating frequency	868 Mhz
Wireless protocol	WM-BUS
WM-Bus manufacturer ID	SMT
Power consumption	Less than 0.1 W
Dimensions (W x H x D)	75 × 49 × 29 mm
Weight	125 g
Maximum altitude	2000 m
Mounting position	horizontal
Ambient temperature	0 to 50 °C
Ambient humidity	max. 95 %, no condensation
Transport and storage temperature	-20 to 60 °C
Protection class	IP 20



## 7 SPARE PARTS

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For ordering spare parts following Part Numbers should be used:

LPC-2.WP2H T/RH control panel, wireless	
LPC-2.WP2H	P/N: 225WP212001001
Programming cable SMB	
Programming cable SMB	P/N: 203SMB14001001
LPC-2.WA1 wireless adapter	
LPC-2.WA1	P/N: 225WA112001001
Interconnection cable	
ICM-x	P/N: 203ICMxxxxxxxx



## 8 CHANGES

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The following table describes all the changes to the document.

Date	V.	Description
15.01.17	4	Technical data update.
30.08.16	3	General update.
01.12.14	2	The initial version, issued as <i>LPC-2.WP2H User Manual</i> .



## 9 NOTES

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