Introduction

The commands described in this document were taken from the communications between the module wifi and the EVO LCD 7 controller board of the pellet stove. The list of commands provided in this document is not exhaustive.

It only covers the following features:
• Ignition
• Heating stop
• Status reading (on, off, cooling, etc ...)
• Setpoint temperature control
• Heating power control

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Description of the serial interface

The stove controller card has a control interface to which the
constructor wi-fi box. This interface consists of 4 terminals:
1. Mass
2. 5V power supply
3. The Rx signal from the 5v TTL serial port
4. The Tx signal from the 5v TTL serial port

The asynchronous serial port operates at a speed of 115200bps.

For information, during the initialization off the controller, a message is sent at a lower speed then standard.
This interface seems to have no xon / xoff type flow control.

Description of controls

Command format

The commands must be sent to the controller card which systematically emits a
response, either an acknowledgment or the response to the requested request. The commands are
consisting of a start-of-frame character and an end-of-frame character. If either of the
characters is missing, the command is not taken into account. The start of frame character is
ESC and the end of frame character is &.

Example frame: <ESC> RDA00067 <&> which gives ← RDA00067 &

When a command that is sent does not require a return value, a response
acknowledgment is returned. This value is: 00000020

List of commands

Below is the list of commands that must be sent on the serial port of the controller card

Status:

Value: ← RD90005f &
This command returns a frame of the same format. The return values are as follows:

Value	State
0802002a	Cooling - When the stove is switched off, there is a cooling phase cooling during which nothing can be done.
08010029	Cooling - same as command above
00000020	Off - The stove is off, ready to be lit
01010022	Ignition - Fireplace ignition phase
02010023	On - The stove is in heating mode.

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Error state:

Value: ←RDA00067&
This command allows you to read the error codes when the stove is faulty,
for example when the pellet tank is empty.
Note that I have not found how to remotely reset the stove controller when a fault is present.
It is possible that for security reasons, this is not possible.
This is mainly a pity for error n ° 8 (power failure) which is not really a failure
and which prevents restarting the stove remotely until the error is manually acknowledged.

The returned values have the following format:
00xx00yy
In the returned value, the xx byte represents the error code.
The yy byte seems to be the error value appended with 0x20.

Value	Description
0	No error
1	Ignition failure
2	Defective suction
3	Insufficient air intake
4	Water temperature
5	Out of pellets
6	Defective pressure switch
7	
8	No current
9	Exhaust motor failure
10	Card surge
11	Date expired
12	
13	Suction regulating sensor error
14	Overheating

Note that I am assuming that the error codes returned by the command interface are the same as those described in the manual. I was able to verify that these codes are identical for errors 5 and 8 which are the most common on a working stove.

Ambient temperature

Value: ← RD100057 &
This command returns a frame of the same format.
The returned value contains the temperature room coded as follows:
XXXX00YY
The value XX contains in hexadecimal the value of the temperature which must be divided by 10 for get a decimal value.
I ignore the YY value.

Example: **00E9** 003E → x00E9 = 233 → 233/10 = 23.3 ° c

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Power
Value: ← RF00X0YY &
This command allows you to adjust the heating power from 1 to 5.

In the command, X represents the power value (1 to 5).
In the command, YY represents the value of X to which we add x58 or 88 in decimal.

Example: ← RF001059 & set the power on level 1, RF00205A set the power on 2,

The value returned by this command is the acknowledgment value: 00000020

Temperature set
Value: ← RF2XX0YY &
This command is used to adjust the setpoint temperature.

In the command, XX represents the temperature setpoint in hexadecimal.
In the control, YY represents the setpoint temperature at which we add x4B or 75 in decimal.

Example: ← RF21405f & sets the setpoint temperature to 20 ° c.
Note that the temperature of setpoint is an integer.

The value returned by this command is the acknowledgment value: 00000020

Ignition
Value: ← RF001059 &

The value returned by this command is the acknowledgment value: 00000020

Note that it is preferable to send this command only when the stove status is: Off

Cool down
Value: ← RF000058 &

The value returned by this command is the acknowledgment value: 00000020

Note that it is preferable to send this command when the stove status is: On or Ignition

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Hardware integration

The easiest in my case was to control the stove remotely via wi-fi, so I had to find a wi-fi gateway to the serial port of the controller.
In seeking a solution of this type, I came across a solution based on an ESP8266 board and associated software ESPeasy.
In this configuration, by selecting a "Device" of the "Communication - Serial Server" type, I obtained directly what I was looking for.

For information, given the low current required for the ESP8266 board, I decided to supply it with the 5V supplied by the stove's controller board.

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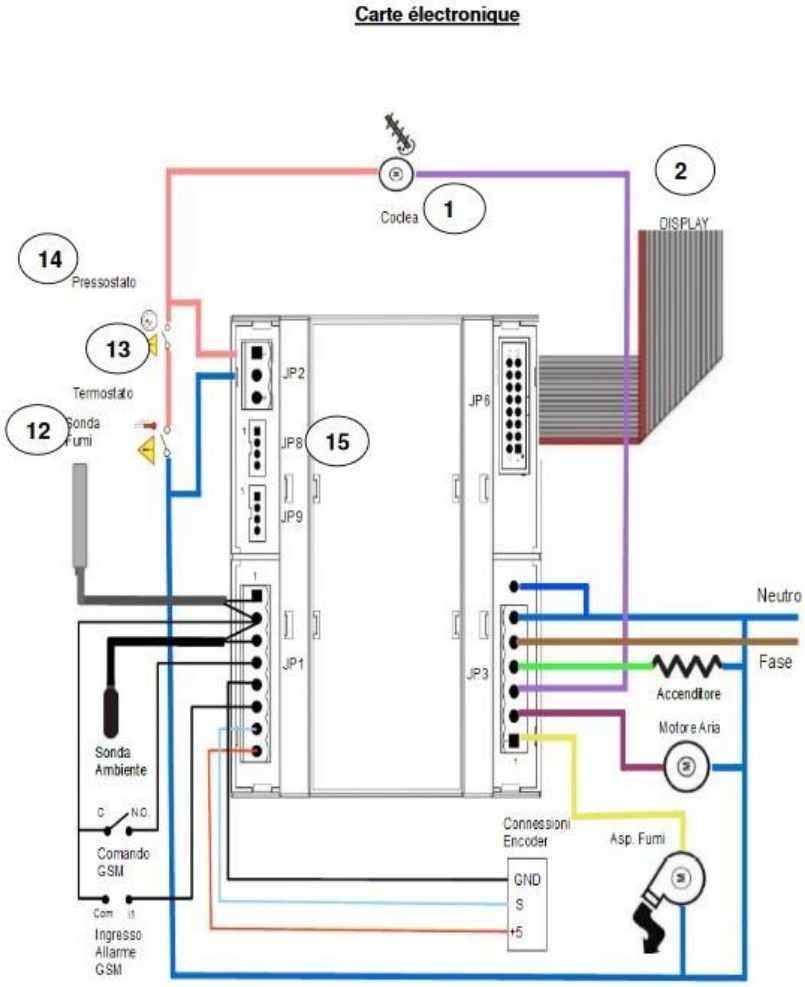
Controller serial port

The controller's TTL serial port is located on the JP8 connector, location no.15 on the diagram below.



1 : vis sans fin ; 2 :display ; 3 : neutre ; 4 :phase ; 5 : bougie ; 6 : ventilateur air ; 7 : extracteur des fumées ; 8 : connexions encodeur, 9 : accès alarme GSM ; 10 : commande GSM ; 11 : sonde ambiante ; 12 : sonde fumées ; 13 : thermostat ; 14 : pressostat ; 15 : JP8 branchement câble dispositif wi-fi

Pin assignment of connector JP8

Connection	*Description*
1	Gnd
2	RX ttl
3	TX ttl
4	+5 volt

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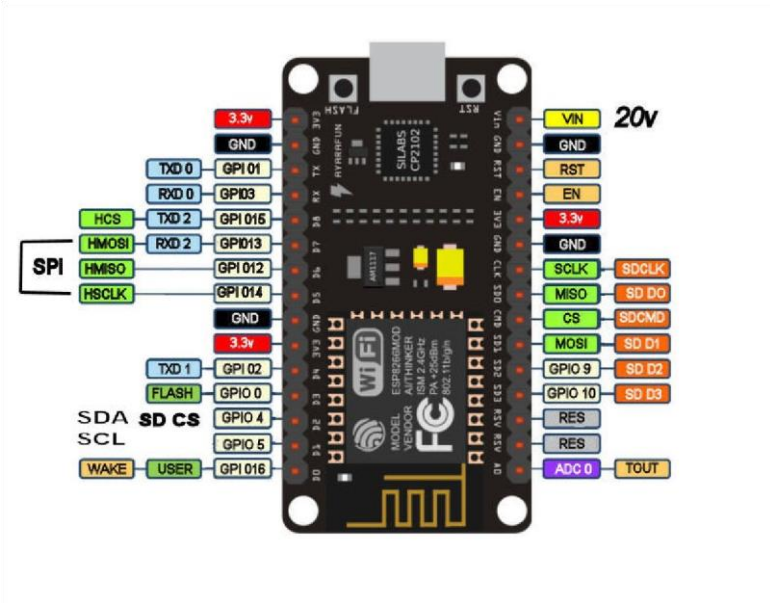
Pinout of the ESP8266



Serial Port Interconnection

JP8 Controller	ESP connector
Pin 1 - GND	Pin - GND
Pin 2 - Rx	Pin - Tx *
Pin 3 - Tx	Pin - Rx *
Pin 4 - +5v	Pin - VIN

• Note: consider the voltage difference between the stove controller board (5v) and ESP8266, it is imperative to insert a "Level shifter" circuit between the Tx boxes and Rx.
In my case I choose a circuit with 4 inputs / outputs.

• The connection of the "level shifter" circuit requires a 5V power supply, a + 3.3V power supply that can be taken from a power supply output of the ESP8266 board.
Then connect the Tx and Rx pins of the HV side controller and the Rx and Tx pins of the ESP8266 on the LV side. On this type of circuit, the signals are either entry or exit.

• Finally, do not forget to cross the Rx and Tx signals at the ESP8266.

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