



Romano Injection System

ANTONIO

Romano Injection System ECU

ANTONIO is the last generation phased sequential system designed by Romano Srl.

This system is the result of the research and development process carried out by the Electronic Engineering Division of Romano group and his long-time experience in gas for autotractor use field.

ANTONIO system is patented thanks to its new functions and its cutting-edge technology without comparison in the market.

ANTONIO ECU is composed by:

- a **Hardware** with:
 - Innovative functions
 - Very new computer algorithms and concepts
- a **Software interface** designed with care and easy-to-use:
 - It's user-friendly and customizable;
 - Allows a fast communication with Gas ECU;
 - Makes the diagnosis of all system components, checking the eventual causes of problems;
 - Has a Manuals section where the installer and the end-user can find all the useful information for the correct use of the system
- a main **Wire Harness**:
 - Very easy to fix
 - With all necessary connections provided with a connector (the wires without connectors are optional).

The latest hardware version will be available very soon: the same ECU to convert to Gas (LPG-CNG) indirect injection, direct injection and diesel vehicles.

For this hardware we developed new computer algorithms which allow a correct control of Air/Gas mix at every different engine working conditions. Moreover, by OBD connection, the system can elaborate all the available data to make the corrections for a good carburation, adjusting it to the gas characteristics which can change from a refueling to another without the help of the installer.



SWITCH

ANTONIO system is provided with a switch with the following functions :

- Selection of fuel type: GASOLINE or GAS (LPG-CNG). The selected fuel type is indicated by LED lights.
- Showing the fuel level in the tank for LPG or pressure level in the tank for CNG;
- Light and acoustic signal when fuel (LPG or CNG) level in the tank is insufficient ;
- Light and acoustic signal in case of problems with Gas system (diagnosis) ;
- EMERGENCY PROCEDURE: Usually with the injection systems the vehicle starts on gasoline and, once the engine gets the minimum pre-set conditions, switches to Gas automatically. When the vehicle has problems igniting on gasoline, EXTRAORDINARILY, by the switch it is possible to make the vehicle ignite on gas to let the end-user arrive to the nearest assistance workshop.



PRESSURE SENSOR and MAP

Pressure sensor allows **ANTONIO ECU** to detect some parameters which are very important for the right functioning on gas (LPG-CNG).

- By connecting the nozzle (Vacuum) to the aspiration manifold of vehicle, the ECU can get instant by instant the engine load value so, elaborating the other functioning parameters, can calculate the right adjustment for the carburation.
- By connecting the nozzle (Pressure) to injectors rail, the ECU can get instant by instant the Gas pressure value supplied by the reducer so, elaborating the other functioning parameters, can calculate the right adjustment for the carburation. This control allows to switch automatically to GASOLINE if the pressure is too low and cannot supply the engine properly.

RAIL

RAIL is a rigid duct conceived to help injectors installation .

Configuration :

- GAS inlet for hoses with internal diam. 12 mm ;
- Gas temperature sensor with connector (NTC of 4K7 Ohm) ;
- Brass nozzle for hoses with internal diam. 5 mm to connect the MAP (GAS pressure reading) ;
- Nozzles for hoses with internal diam. 7 mm to connect the injectors.

On one side there is the GAS inlet for hoses with internal diam. 12 mm, on the other side there is the GAS temperature sensor and the nozzle for hoses with internal diam. 5 mm to connect the MAP (Gas pressure). On the lower part there are the nozzles for hoses with internal diam. 7 mm to connect the injectors.

There are 4 versions of Romano Rail:

- 2 nozzles
- 3 nozzles
- 4 nozzles
- 5 nozzles

INJECTORS (Romano Fast and Romano Fast2)

Romano injectors are electromechanical devices which, controlled by **ANTONIO ECU**, supply the right quantity of gas (LPG-CNG) to the engine.

According to the different types of engines, there are different sizes of the calibrated nozzle holes as follows:

- TYPE I Ø 1.4 mm
- TYPE O Ø 1.9 mm
- TYPE A Ø 2.2 mm
- TYPE B Ø 2.6 mm
- TYPE C Ø 3.2 mm

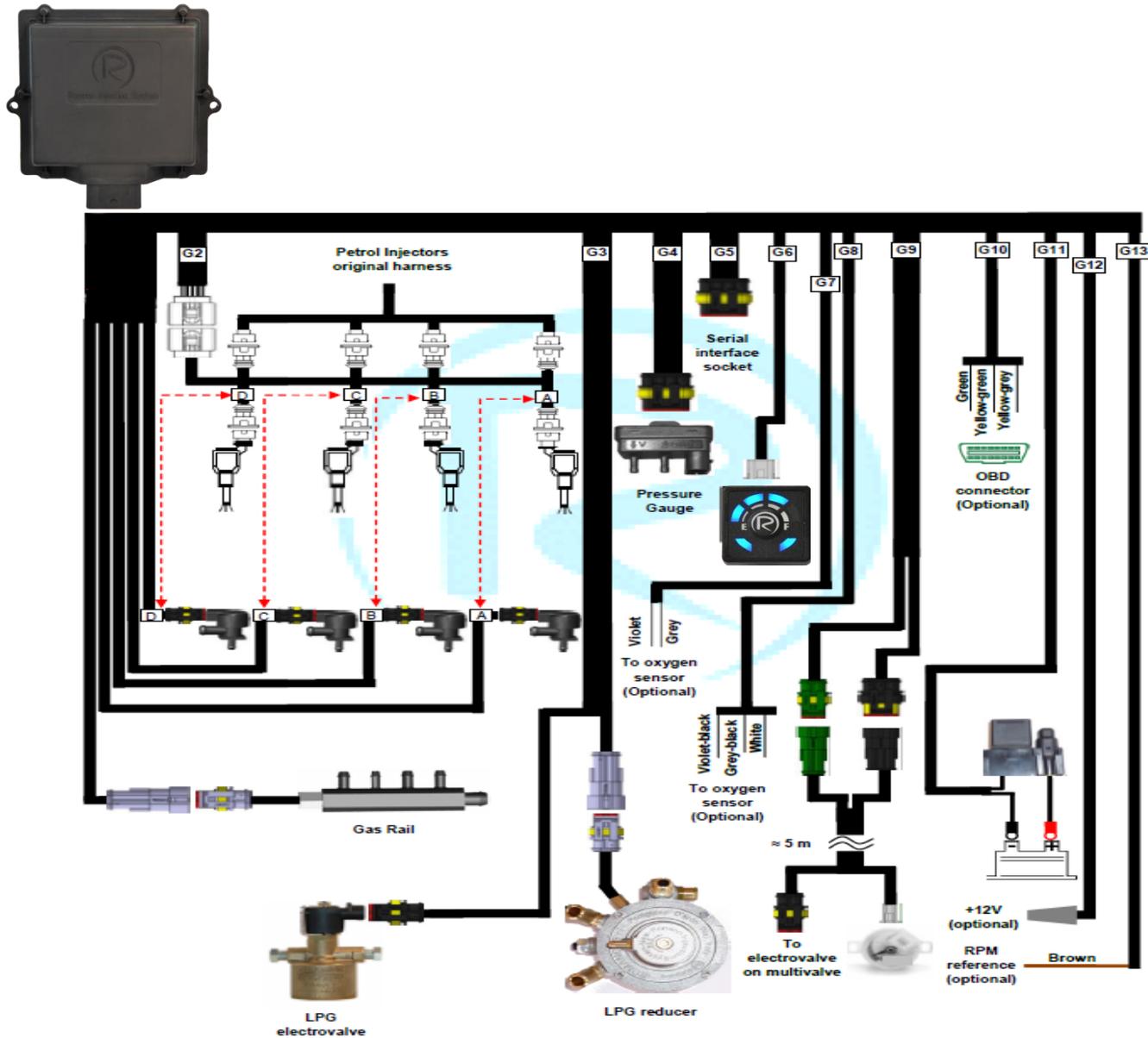
There are also the lists to choose the nozzle size according to the power and number of cylinders of the vehicle.



ECU with hardware PATENTED	NEW The new hardware will allow the conversion to gas (LPG or CNG) by only one ECU which can be used for <i>indirect injection, direct injection and diesel vehicles</i> .
Fuel Type	LPG / CNG
Number of cylinders	2 cylinders – 3 cylinders – 4 cylinders
Autocalibration	NEW Automatic adjustment of map and working pressure of reducer.
Gasoline Injectors Emulator PATENTED	NEW The interruption of gasoline injector negative by the universal injectors cut-off can be done without following the direction of BLACK striped wires. An inverted connection won't cause any malfunctioning.
Gasoline pressure Emulator	NEW Device integrated in the ECU. No need to install extra emulators
LPG/CNG Reducer Pressure	NEW Software with automatic adjustment of working pressure of LPG/CNG reducer
RPM signal	NEW It is not necessary to connect any wire, in any case the main wire harness is provided with a BROWN wire to be connected only in special circumstances.
RPM signal intensity	NEW In special circumstances when RPM signal has very low voltage, if BROWN wire is connected, it is not necessary to install any amplifier and multiplier of external signal .
GAS / GASOLINE management	NEW New algorithms to control gasoline supplies at idle and high speed. User-friendly software with a new design very easy to use.
Diagnosis	NEW Innovative diagnostic functions with error code list, indication of fault cause and trouble-shooting to solve the problems by yourself just following the instructions.
Injections Sequence	NEW New algorithm to control the advanced injections sequence (phasing wheel).
REC Function	NEW Possibility of functioning parameters storage at any time
WIRING HARNESES	<p>NEW All necessary connections for ECU are provided with connectors, the wires without connectors are optional connections.</p> <p>NEW Power relay is located in an apposite box outside the ECU.</p> <p>NEW GAS electrovalves are controlled by ECU through the negative pole (ground), so don't cut connectors and don't connect other devices either to the positive or to the ground.</p> <p>NEW All devices such as timing advance or any other emulator, which need GAS signal, should be connected to YELLOW-RED wires. This outlet will start working (+12V ok) only after the vehicle has switched to gas to avoid any possible problem when running on gasoline or during switching phase.</p>
Temperature control	<p>Reducer Temperature – GAS Temperature (Sensors 4K7 and 2K2)</p> <p>Automatic adjustment of GAS carburation according to the detected temperature values.</p>
Gas pressure control	<p>Automatic switch to gasoline when Gas pressure is low.</p> <p>Automatic adjustment of gas carburation according to the detected pressure values.</p>
Engines control	Turbo – Valvetronic – Start and Stop

Characteristics of ANTONIO ECU	
OBD Control	Connection can be done automatically or selecting one of the following Standards : ISO 9141-2 KWP2000 FAST CAN STANDARD 250 - CAN EXTENDED 250 CAN EXTENDED 500 - CAN EXTENDED 500
Reset DTC	With all wires connected and OBD connection activated it is possible to reset possible diagnostic errors.
Adaptativity	Automatic adjustment of calibration according to the parameters detected by OBD
Short injections control	Short injections control (extra injections) by appropriate slider
Lambda sensors control	Reading and emulation of the 2 Lambda sensors
Installation Test	Automatic check of gasoline injectors connection and manual check of GAS injectors
LANGUAGES control	The ECU software is multilingual
Vehicle Assembly Diagrams	The software includes assembly diagram of the vehicles.
GUIDE	Inside the software you can always find and consult - even when off-line - the following files: <ul style="list-style-type: none"> • CPU ANTONIO Error codes; • Installer Manual; • AIS software Manual; • End-ser Manual (printable)
SWITCH	New design conceived for last generation vehicles dashboards.
ECU	Plastic box with protection level IP67
MAP	Conceived for reading collectors pressure and GAS pressure values. Plastic box with protection level IP67
Software design	The software is completely customizable

Characteristics of ANTONIO ECU	
Supplied voltage	Battery voltage (8 ÷ 16V)
Working Temperature	- 40°C ÷ 125 °C
Idle speed current absorption	Idle Iq=55 mA – Stand-by mode Iqs<1µA
Injectors GAS outlets	From 2 ÷ 4 injectors – I _{max} 6 A continuous for each cylinder with maximum battery voltage 16V
Electrovalves outlets	P _{max} Tot. 130W; I _{max} 9,6 A (reducers outlet + tanks outlet)
Level Sensors	Standard ROMANO for LPG and CNG – CUSTOM– 0 ÷ 90 Ohm- Linear active Sensors 0 ÷ 5V
MAP sensor	Standard ROMANO
Reducer temperature Sensor	Standard ROMANO 4.7 KΩ / 2.2 KΩ
Gas temperature Sensor	Standard ROMANO 4.7 KΩ / 2.2 KΩ
Lambda sensors	0 ÷ 1 V 0 ÷ 5 V UEGO
ECU homologations	 E10R – 03 0831  67R – 01 0020  110R – 00 0044
Switch homologations	 E10R – 03 0830
MAP homologations	 E10R – 03 0832  67R – 01 0019  110R – 00 0043





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