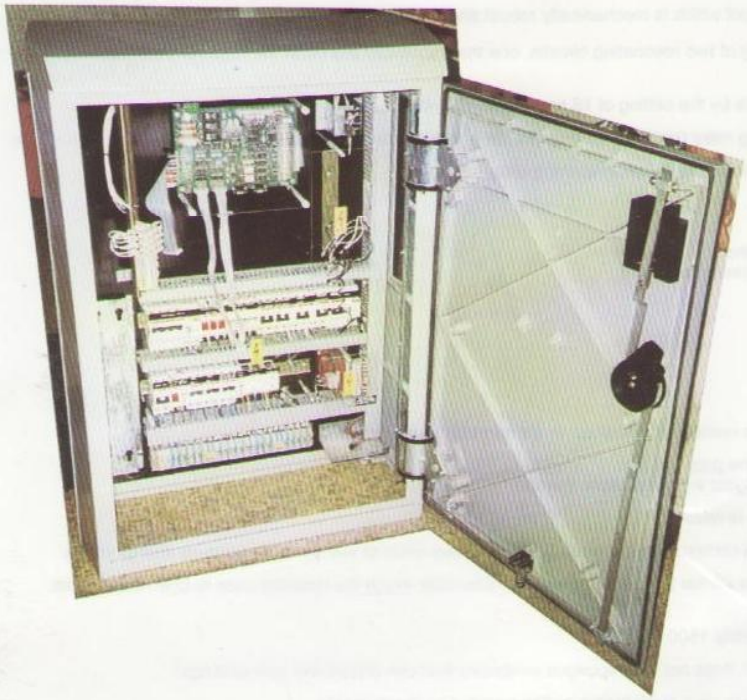

# ELECTRONIC BOLT

(PATENT)

NEW SYSTEM TO OPEN AND CLOSE

# ELECTRONIC BOLT
## (PATENT)

This System has been realized for the automatic opening of thermoplastic cabinets.

The study has been based for the use on Telecom Italia Spa type cabinets, all results have been obtained on this application.

The System has been developed to obtain a high degree of security and reliabilty against attempts of undue opening and the mechanical hold of the bolt in stand-by after it has been locked.

The first characteristic has been obtained by utilizing an electromagnetic field with tuned resonating frequency, of concentrated high intensity, taking ionto account of the physical dimensions of the field and the distribution of the strength lines.

In this condition any possibity of influence by foreign radiated fields in any part or of any type can be axcluded.

The second characteristic has been obtained by carefully selecting a slot which is mechanically robust and adeguately positioned.

The general functional principal of the system is based on the coupling of two resonating circuits, one the transmitter the other the receiver via a coded key signal which enables the opening.

The number of differs of the coded key signal is equal to that obtainable by the setting of 16 two position dip-switches.

The transmitter and receiver in their combined action power a releasing relay (siot) which releases the bolt only when the stored energy reaches the preset level.

The system is basically formed by three parts, the receiver, the transmitter and the programming unit.

## The Receiver

This is the non moveable part of the system and is installed in the cabinet.
The installation is very easy and doesn't requires any alteration of the preexistent bolt.

The electrical circuit and the siot are enclosed in a plastic housing.
The housing is different for every type of cabinet.
Figure 1 illustrates the housing for type A cabinets.

The electronic circuit is passive and is fed by the transmitter.
The receiving circuit is of the resonant type with encoder.

The decoder analyzes and stores the code and other data, such as the number of openings, in it's non volatile memory.

The number of these last can be read and displayed, also zeroed, by the programmer.
The electrical circuit transfers power from the modulating signal to a trigger which releases the slot.

When the preset power threshold and correct code is received the slot is relesed.

The capacity of the "condensor" element has been calculated to offer a compromise between the correct excitation of the slot and minimum energy waste.

This is the mobile part of the system. The unit is of reduced dimensions similar to those of a keyfob transmitter wnich the operator uses to open the cabinet.

The transmitter is powered by an PP3 type drycell battery.
The battery life is sufficient for a high number of activations, approximately 1500.

The transmission circuit is basically a sine wave signal generator which does not ernit spurious emissions that can disturb the surroundings.

The higth efficency oscillator is excited at the preset frequency of 26 KHz via a push button switch anabled by the operator.

The emission of the signal is confirmad by the lighting of the red led on the unit.

The circuit is completed by the encoder that modulates the 16 bit serial code memorized in the non volatile memory.

The envelopment of the signals produces the electromagnetic field which is tranmitted.

## The Progammer

This unit is housed in a weatherproof cabinet features an I. CD display for friendly user interface and is powered by a PP3 type drycell battery.

The progammer transfer and/or reads back the code both to the tranmitter and receiver.

The I.CD display is controlled by softkeys and visualizes the codes transferred or programmed on both the transmitter and receiver units.
It also reads and visualizes the number of times the receiver units has been opened. This counter can also be reset to zero if required.

The eletronic circuit essentialy transfers to the units the code which it is set for via the keys on the keypad.

The unit can also read back and decode codes set and resident externally to the unit itself.

The connection between the progammer and the transmitter and/or receiver is via a four core cable. Two for the power supply of the external unit, one for the two way serialization of the code, the fourth for the setting of the progamming mode of the external unit.

## Thermal Tests

In The development of the system all discrete components have been selected for the specific type of application, this to ensure maximum reliability and functionality.

The system has futhermore been put through thermal stress cycles to verify the functionality of the system in prohibitive ambient conditions and also for reliabilty in time.

In both cases the temperature excursion range was from -20° lo +70°C.

All test resulted 100% successful and a superior grade of security confirmed by the time required for each opening which remaind always within the 3 second limit set in the project.

## Operation: opening

The opening procedure requires that the transmitter be pointed to a specific refernce point which is marked on the external surface of the cabinet.

The tolerance around this specific point must be contained in a 3 cm radius of this last.

The opening occurs after three seconds after the transmitter has been pointed and then successively activated.

The opening is signaled by the mechanical noise emmited by the opening of the slot and by the blinking of the receiver led.

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