

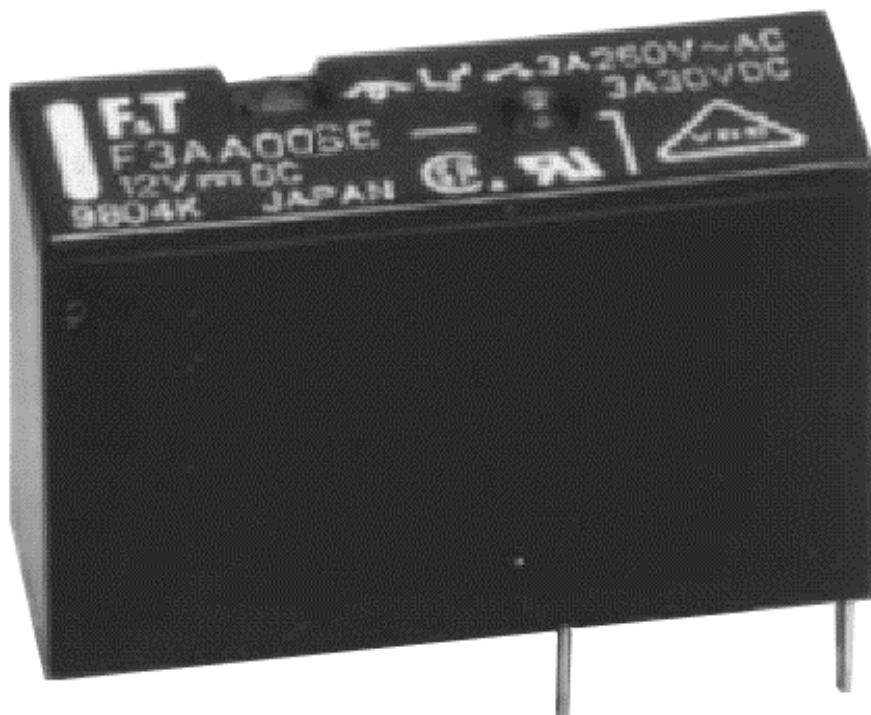
*Theoretic/Practical course on BASCOM AVR Programming.
Author: DAMINO Salvatore.*

Management of Output Lines Through Relays

A typical use of **I/O** lines, available on **Mini Module**, is the management of output signals. When the outputs must drive high power devices, a widely used component is the **Relay**.

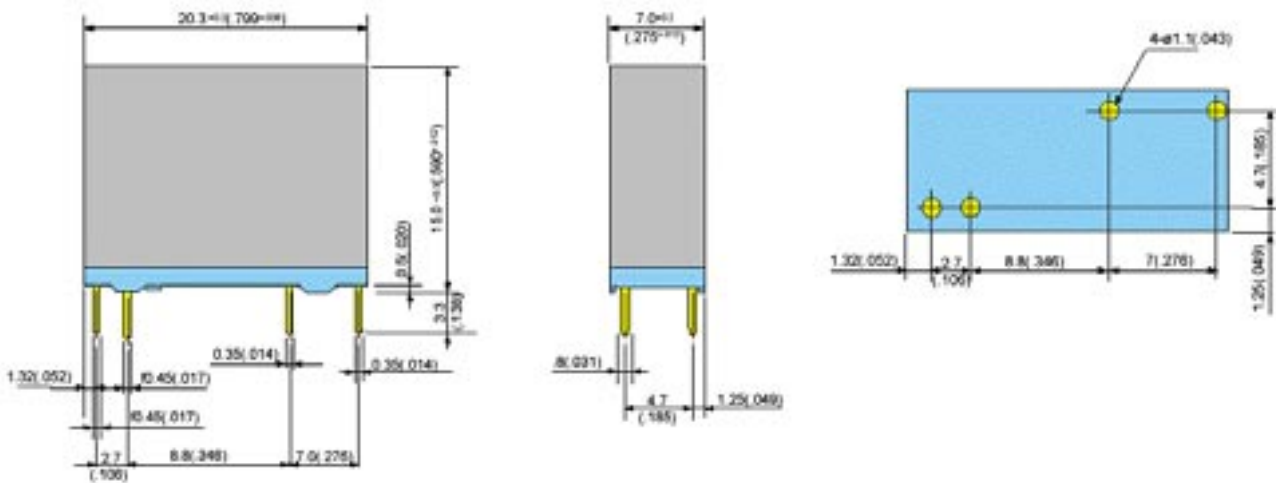
The **Relay** is a simple electro-mechanical device that, once it is properly driver, is capable to command many systems, even with relevant voltages and currents.

In the application electric diagram of the **Example.066** it is described how it is possible to buffer output lines, available on **Mini Module**, by using a **Transistor** and some resistors, that all together drive a **Relay**. In order to increase the effort in practical use of the circuit, it has been added a **LED** diode, that visualize the output status.



Relay Model FTR-F3AA006E from Fujitsu.

On the market there are a really high number of Relays models that are different for mechanical dimensions, contact supported load, power supplies, number and types of contacts, etc.



Dimensions of Relay Model FTR-F3AA006E from Fujitsu.

Inside the same package container, or in other words with the same external size, are available more **Relays** capable to work with the same **Nominal Powers** and with different **Nominal Voltages**.

According with the selected nominal voltage, you will discover that the manufacturer declare the minimum voltages under which the **Relay** can't work correctly.

If the user must deeply examine these features, it is possible to download the specific Data-Sheet where all these information are reported.

MODEL	Nominal Voltage	Coil Resistance	Operate Voltage	Release Voltage	Nominal Power
FTR-F3AA005E(-)	5VDC	125 Ω	3.75VDC	0.5VDC	200mW
FTR-F3AA006E(-)	6VDC	180 Ω	4.5VDC	0.6VDC	200mW
FTR-F3AA009E(-)	9VDC	405 Ω	6.75VDC	0.9VDC	200mW
FTR-F3AA012E(-)	12VDC	720 Ω	9.0VDC	1.2VDC	200mW
FTR-F3AA018E(-)	18VDC	1.620 Ω	13.5VDC	1.8VDC	200mW
FTR-F3AA024E(-)	24VDC	2.880 Ω	18.0VDC	2.4VDC	200mW

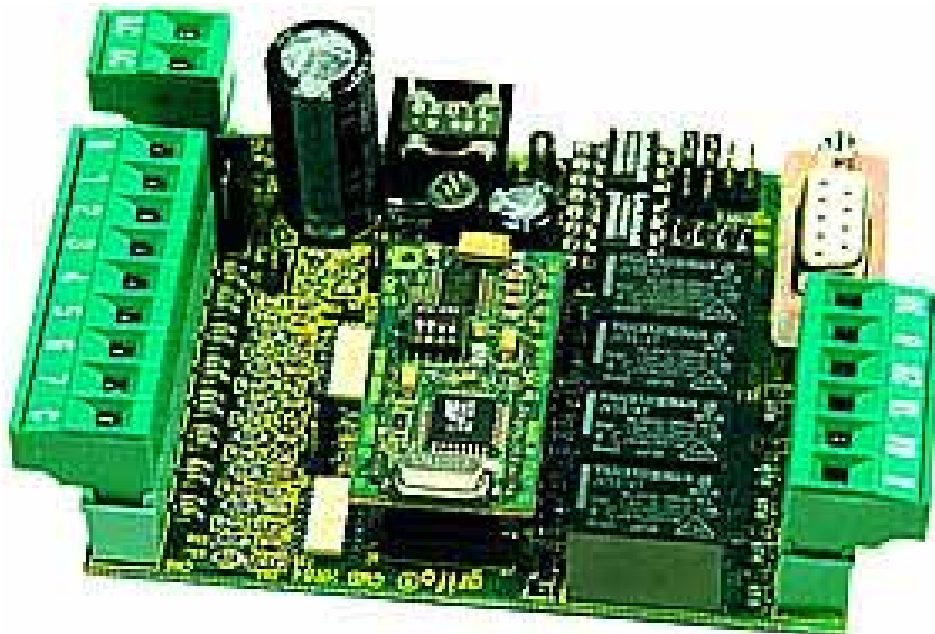
Table with Relay Model FTR-F3 from Fujitsu.

The 3 examples enclosed in this charter, uses the same **Pin-Out** available on the **Mini BLOCK** named **GMB HR84**.



GMB HR84 with 8 Optocoupled Inputs and 4 Output Relays.

This card allows to mount the used Mini Module and to directly use the proposed programs and/or develop applications that exploit the **GMB HR84** resources.



Opened GMB HR84 with GMM AM08 Mini Module and RS 422 Interface.

Example.066. Output Relays Management. Through the RS232 Communication Serial Line, it is Defined the Status of the Output Relay.

Added Definitions:

None

Added Declarations:

None

Added Instructions:

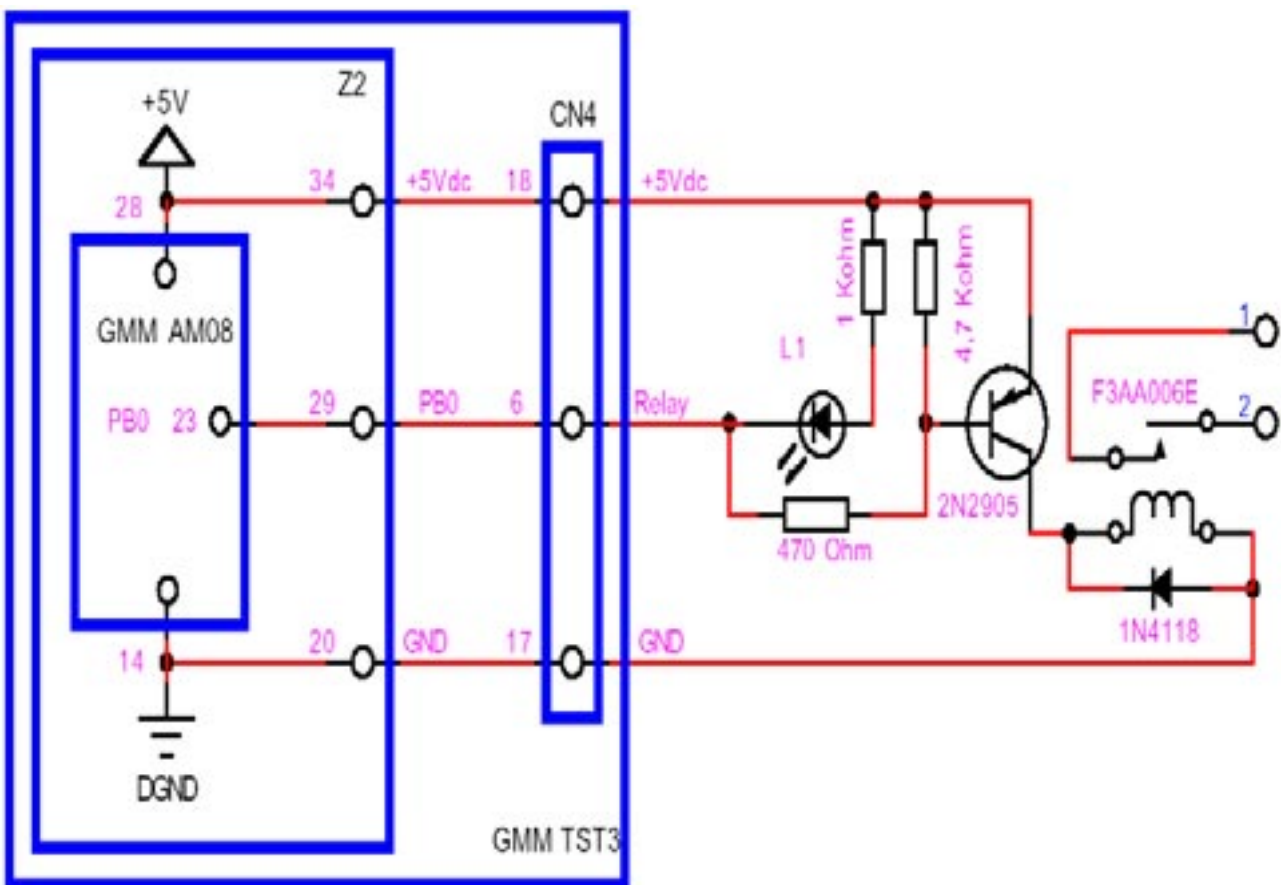
None

Added Operators:

None

Example program **066** of **BASCOM AVR** course.

Buffered outputs management: it drives a relay, through the serial console, in **RS 232**, that select the enabled or disabled status.



Application Diagram for one Relay Driving.

The relay is driven by **one I/O** line of microcontroller, connected to **CN4** connector of **GMM TST3**, as described in electric diagram.

The program describes its functionalities and uses a serial console provided of monitor and keyboard with a fixed physical protocol at **19.200 Baud, 8 Bit x chr, 1 Stop bit, No parity**.

This console can be another system capable to support a serial **RS 232** communication.

In order to simplify the use it can be used a **PC** provided of one **COMx** line, that execute a terminal emulation program as **HYPERTERMINAL** or the homonym modality provided by **BASCOM AVR** (see **IDE Configuration**).

The program works only when the **GMM AM08** is mounted on **Z2** socket of **GMM TST3!!**

Example.067. Output Relays Management. Through the RS232 Communication Serial Line, it is Defined the Status of two Output Relays.

Added Definitions:

None

Added Declarations:

None

Added Instructions:

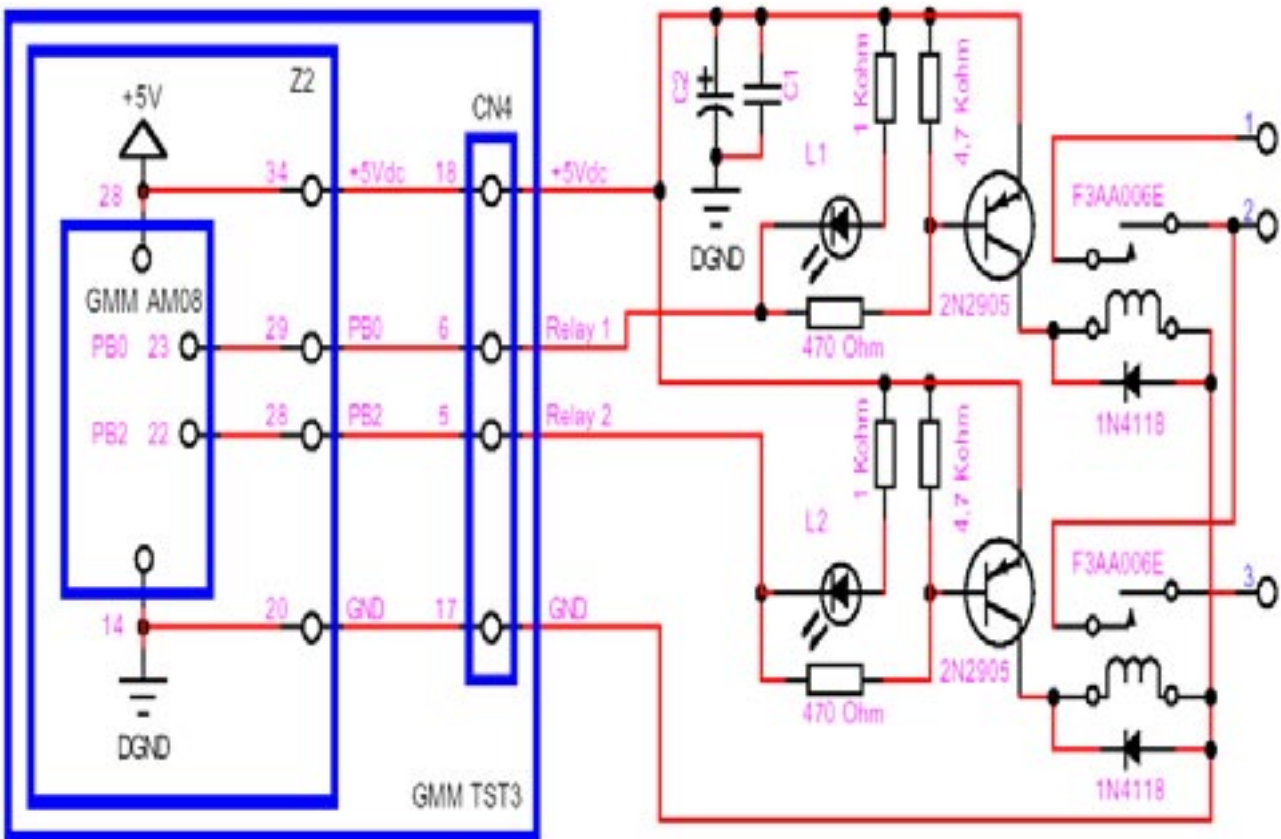
None.

Added Operators:

None

Example program 067 of **BASCOM AVR** course.

Buffered outputs management: it drives two relays, through the serial console, in **RS 232**, that select the enabled or disabled status.



Application Diagram for two Relays Driving.

The relay are driven by **two I/O** lines of microcontroller, connected to **CN4** connector of **GMM TST3**, as described in electric diagram.

The program describes its functionalities and uses a serial console provided of monitor and keyboard with a fixed physical protocol at **19.200 Baud, 8 Bit x chr, 1 Stop bit, No parity**.

This console can be another system capable to support a serial **RS 232** communication.

In order to simplify the use it can be used a **PC** provided of one **COMx** line, that execute a terminal emulation program as **HYPERTERMINAL** or the homonym modality provided by **BASCOM AVR** (see **IDE Configuration**).

The program works only when the **GMM AM08** is mounted on **Z2** socket of **GMM TST3!!**

Example.068. Output Relays Management. Through the RS232 Communication Serial Line, it is Defined the Status of four Output Relays.

Added Definitions:

None

Added Declarations:

None

Added Instructions:

None.

Added Operators:

None

Example program **068** of **BASCOM AVR** course.

Buffered outputs management: it drives four relays, through the serial console, in **RS 232**, that select the enabled or disabled status.

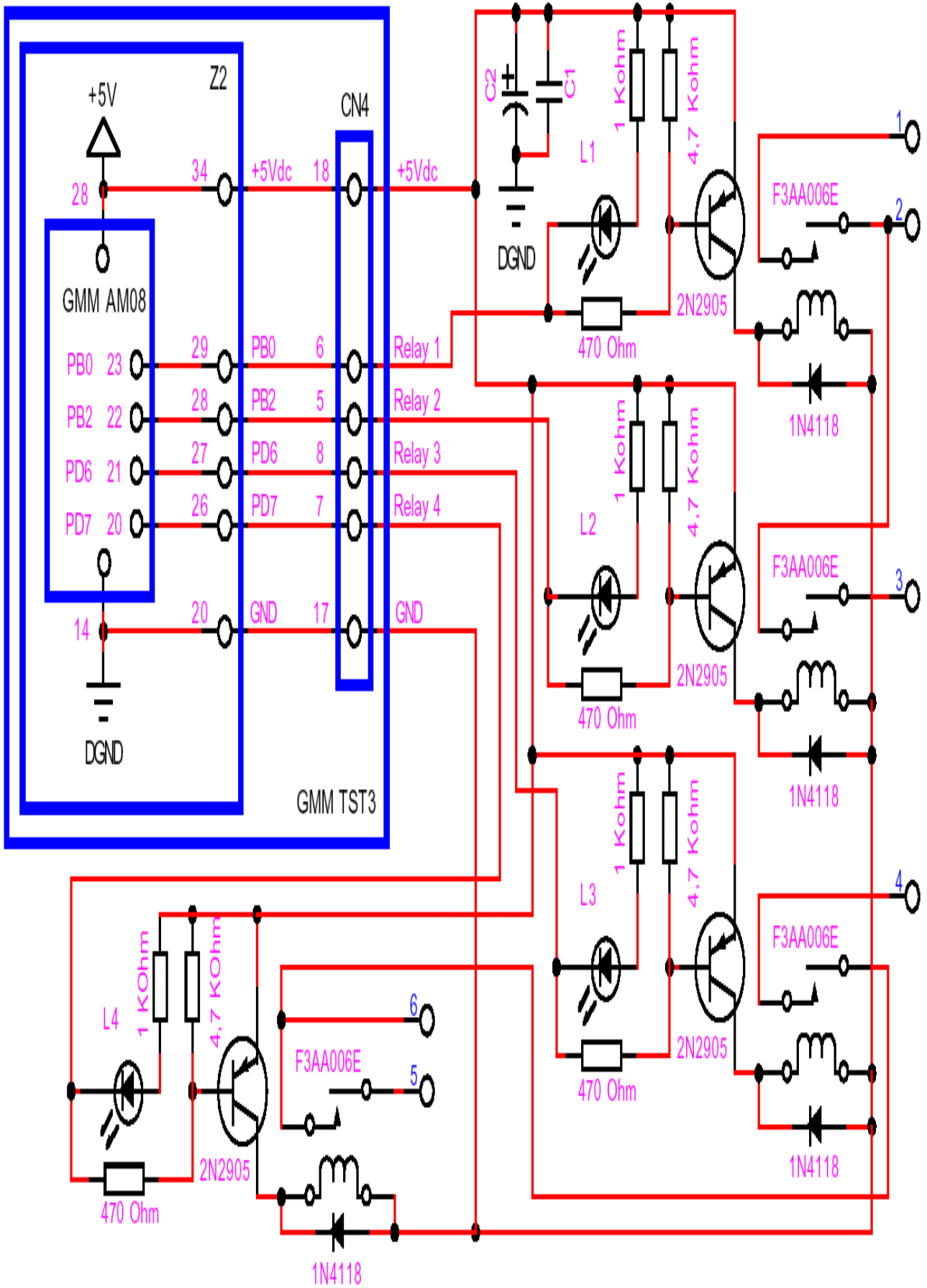
The relay are driven by **four I/O** lines of microcontroller, connected to **CN4** connector of **GMM TST3**, as described in electric diagram.

The program describes its functionalities and uses a serial console provided of monitor and keyboard with a fixed physical protocol at **19.200 Baud, 8 Bit x chr, 1 Stop bit, No parity**.

This console can be another system capable to support a serial **RS 232** communication.

In order to simplify the use it can be used a **PC** provided of one **COMx** line, that execute a terminal emulation program as **HYPERTERMINAL** or the homonym modality provided by **BASCOM AVR** (see **IDE Configuration**).

The program works only when the **GMM AM08** is mounted on **Z2** socket of **GMM TST3!!**



Application Diagram for four Relays Driving.