Second Edition

32 INDUSTRIAL INPUT MODULE

The GESINP-2A module offers the best solution currently available on the electronic board market with regard to interfacing between the microprocessor and industrial environment, offering a maximum number of inputs on a small surface at low cost. 32 inputs are grouped on one Euroboard, isolated by optocouplers which can work on 12, 24 and 48 V, with a maximum input current of I 5 mA. It is without a doubt the best number of inputs/occupied surface proportion and thus the most economical.

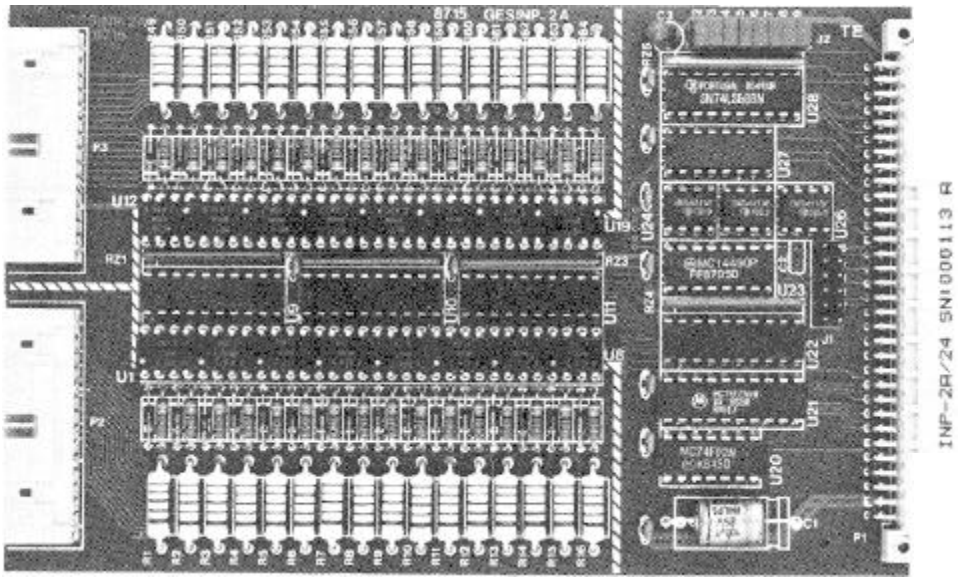
Of the 32 input lines, 6 can be connected to certain bus signals such as " Reset ", " Halt " or " Interrupts ".

These 6 lines are connected to the signals via a debouncing-circuit in addition to the opto-electric coupling.

The input signals are connected by two 26-pin connectors (16 inputs each) compatible with our standard PC board adaptor available as an option (GESICU-1 A).

Technical features

- 32 industrial inputs
- Four 8-channel ports
- 1 500V opto-coupler isolation
- Input voltage 12 V, 24 V, or 48 V (GND common)
- Input current max. 1 5 mA
- Optional debouncing on 6 input lines
- Fully decoded address
- External connection by two 26-pin flat cable connectors
- Separate power lines for the 2 1/0 connectors
- Single power supply: + 5 V



References

GESINP-2A/24: 32 industrial inputs:24V/15 mA max.
GESINP-2A/48: 32 industrial inputs: 48 V/15 mA max.

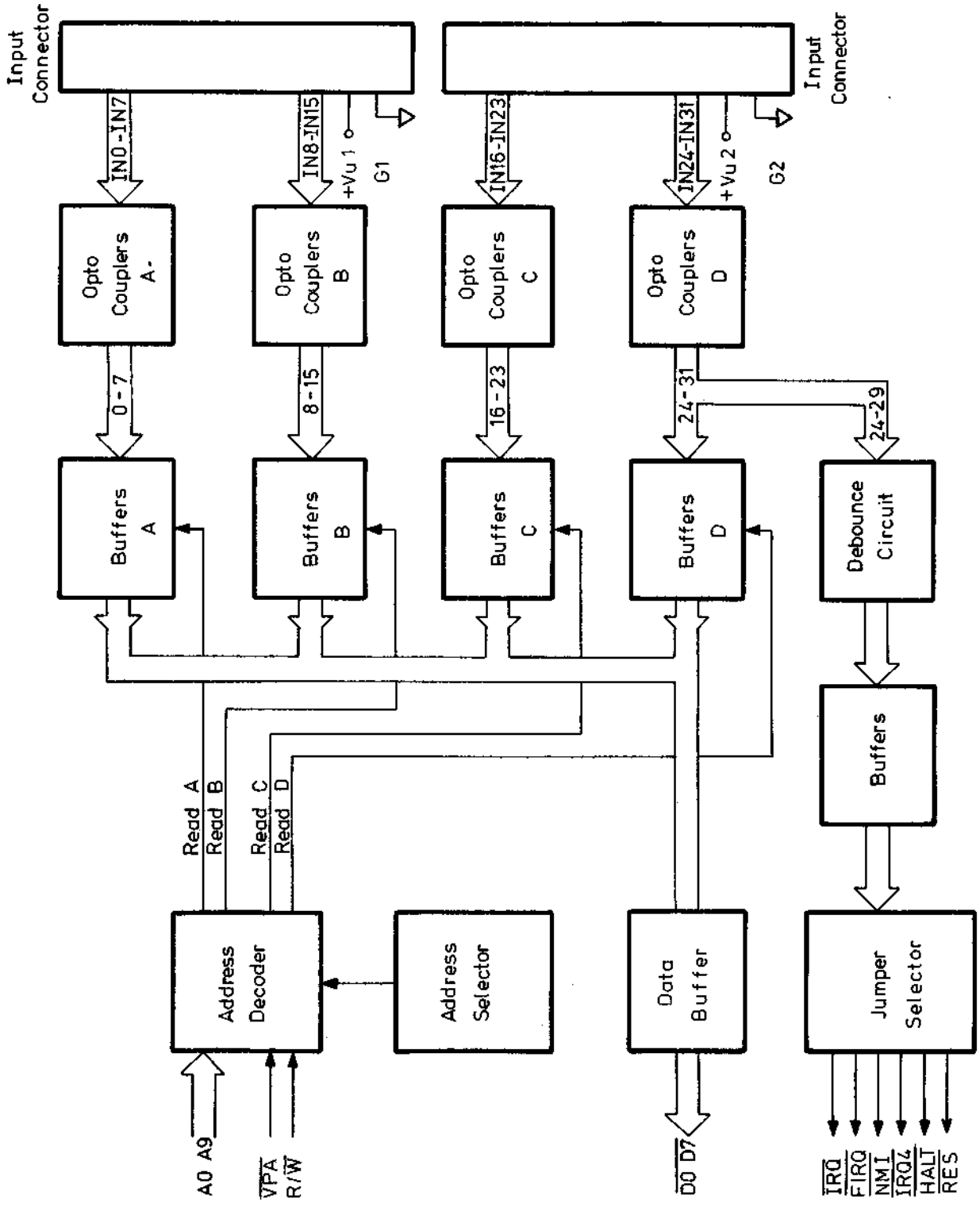


Figure 1.1 Block Diagram

1. GENERAL INFORMATION

1.1 DESCRIPTION

The GESINP-2A Euroboard provides the user with 32 optocoupled inputs addressable through 4 ports of 8 channels each. Input voltage is 12 V, 24 V (GESINP-2AT24) or 48 V (GESINP-2AT48) at a maximum current of 15 mA.
Six of the 32 input lines can be connected to RES, NMI, IRQ, FIRQ, IRQ4 and HALT signals of the bus through a debouncing circuit.

The GESINP-2A module is fully compatible with the standard G-64 bus, it is also compatible with the GESINP-1 module and replaces it.

The block diagram of fig. 1.1 illustrates the different parts of the module and their interconnections.

INTERCONNECTIONS

1.2 SPECIFICATIONS

Input lines	- 32 optocouoled with + Vu common (6 debounced) - Separate power lines for the 16 inputs of P2 and the 16 inputs of P3 connector
Access	Through 4 ports of 8 channels each
Isolation:	1500 V by optocoupler
Input voltage:	12V/24Vor48V(GESINP-2AT48)
Input current:	1 6 mA max (24 V) 7 mA max (48 V)
Bus interface:	- Data bus: 3 state TTL compatible - Other signals: TTL compatible
Bus driver:	48 mA device type
Power requirements:	* 5 Vdc 300 mA typ.
Operating temperature	* 5' to + 55'C
PCB dimensions:	100 x 160 mm

Table 1.1 Specifications

2. PREPARATION FOR USE,

2.1 CONNECTOR AND JUMPER IDENTIFICATION

Table 2.1 identifies the jumpers and connectors of the GESINP-2A module. Fig. 2.1 shows their location on the printed circuit.

Designation	Function
P1	G-64 Bus interface connector
P2, P3	Opto isolated input connector
J1	Debounced line selector
S1	Module address selector

Table 2.1 Connector and jumper identification

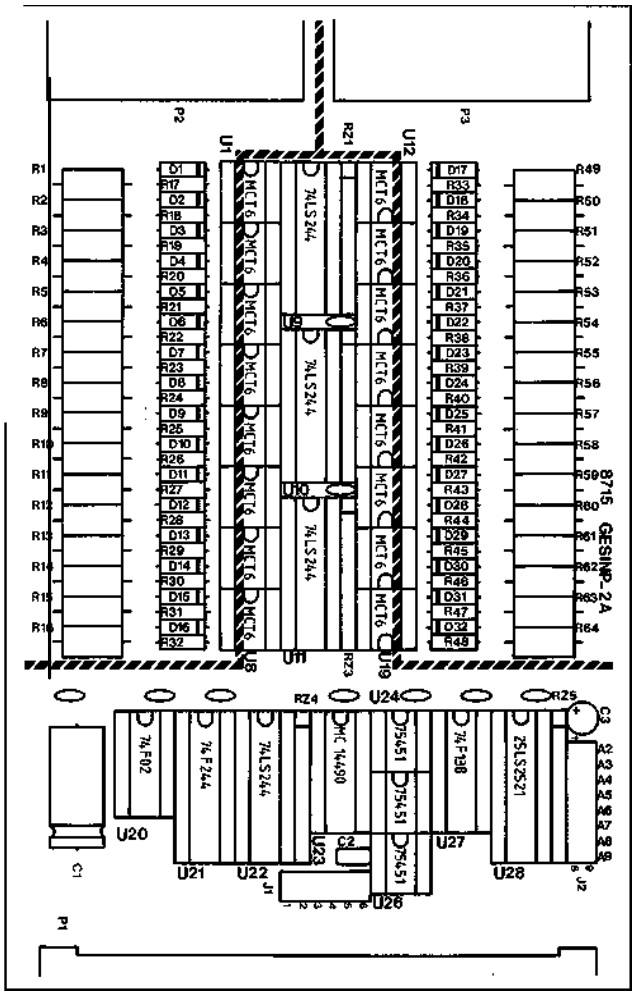


Fig. 2 GESINP-2A: Implementation

2.2 INPUT SIGNAL INTERFACE

Table 2.2 identifies the input lines connected to P2 and P3.

Pin number P2 or P3	Function		Read address (base + :..)	
	P2	P3	P2	P3
8 to 15	Input 0 to 7	Input 16 to 23	0 (d0-D7)	2 (D0-D7)
16 to 23	Input 8 to 15	Input 24 to 31	1 (D0-D7)	3 (D0-D7)
1-3, 25, 26	User's System Ground			
4, 7, 24	Not Used			
5, 6,	Positive 12/24 V or 48 V[2] User's System Voltage[1]			

1 The common user's voltage of P2 is isolated from the voltage of P3. This allows the user to have a different potential for the inputs of P2 and P3.

2 For 12 V or 24 V version, Rx value is 1.6 Kohm. For 48 V version, Rx value is 6.8 Kohm.

Table 2.2 P2 and P3 connector description.

2.3 INTERFACE WITH THE G-64 BUS

The GESINP-2A module interconnects directly on the (3-64 Bus. Signals used by the module are identified in the table 2.3. For more information on the bus, refer to the G-64/G96 Bus Specification Manual.

ROW B		ROW A			Definition
GND		GND		1	Power
A8		A0		2	Address Lines A0 to A23
A9		A1		3	
A10	*	A2		4	
A11	*	A3		5	
A12	*	A4		6	
A13	*	A5		7	
A14	*	A6		8	
A15	*	A7		9	
$\overline{BRQ}$	*	BGRT	*	10	Control and Interrupt Lines
$\overline{DS1}$	*	$\overline{DS0}$	*	11	
$\overline{BGACK}$/$\overline{BBUSY}$	*	$\overline{HALT}$		12	
Enable	*	SYCLK	*	13	
$\overline{RES}$		$\overline{VPA}$		14	
$\overline{NMI}$	*	RDY/$\overline{DTACK}$	*	15	
$\overline{IRQ1}$	*	$\overline{VMA}$	*	16	
$\overline{IRQ2}$	*	R/$\overline{W}$		17	
IACK	*	IRQ4	*	18	
$\overline{D12}$	*	$\overline{D8}$	*	19	Data Lines D0 to D15 and Arbitration Lines
$\overline{D13}$	*	$\overline{D9}$	*	20	
$\overline{D14}$	*	$\overline{D10}$	*	21	
$\overline{D15}$	*	$\overline{D11}$	*	22	
$\overline{D4}$		$\overline{D0}$		23	
$\overline{D5}$		$\overline{D1}$		24	
$\overline{D6}$		$\overline{D2}$		25	
$\overline{D7}$		$\overline{D3}$		26	
$\overline{BERR}$	*	$\overline{Page}$	*	27	Misc.
Chain In	*	Chain Out	*	28	
+ 5 V bat.	*	$\overline{PWF}$	*	29	Power
– 12 V	*	+ 12 V	*	30	
+ 5 V		+ 5 V		31	
GND		GND		32	

* Not used by the GESINP-2A module

Table 2.3 PI connector, G-64 Bus.

2.4 DEBOUNCED LINES

Debounced lines can be used to activate 6 control lines of the bus. They are identified in table 2.4. Debouncing is made by MCI 4490 devices; its oscillator frequency is determined by Cx and is a user's option:

$$Fo \approx \frac{1.875}{Cx} \quad \text{with Fo in MHz, Cx in pF}$$

J1	Debounced	Input line to activate
1–12	$\overline{IRQ4}$*	IN 29
2–11	$\overline{FIRQ}$	IN 26
3–10	$\overline{IRQ}$	IN 28
4– 9	$\overline{NMI}$	IN 27
5– 8	$\overline{RES}$	IN 24
6– 7	$\overline{HALT}$	IN 25

* Option used in place of Halt Ack G-64 bus signal

Table 2.4 Debounced lines

2.5 ADDRESS SELECTION

The base address of the module is selected by J2 in the I_Kbyte field reserved for peripherals which is caracterised by VPA signal. A field of 4 addresses is required by the module as defined in table 2.5.

J2 allows the user to select of 256 base addresses $\overline{VPA}$ field:

J2	OFF	ON
1 o o 16	A2	$\overline{A2}$
2 o o 15	A3	$\overline{A3}$
3 o o 14	A4	$\overline{A4}$
4 o o 13	A5	$\overline{A5}$
5 o o 12	A6	$\overline{A6}$
6 o o 11	A7	$\overline{A7}$
7 o o 10	A8	$\overline{A8}$
8 o o 9	A9	$\overline{A9}$

Table 2.6 Address selection

2.6 USE OF GESICU-1 module

The GESICU-1 module is designed to offer a connection unit for GESPAC Digital Input/Output euroboards. Table 2.7 shows the correspondence between GESICU-1 and the GESINP and GESOUT boards. The GESICU-LA can be used to interconnect 1/0 signals to the G 'ESINP-2A module. Its schematic diagram is shown on fig. 2.2. Refer please to the GESICU-1 data sheet for more information.

Connection unit	Digital Input/Output module
GESICU-1A (common plus)	GESOUT-1 GESOUT-2A (ULN 2804) GESINP-2A
GESICU-1B (common ground)	GESOUT-2B (UDN 2983) GESINP-1 GESINP-2B

Table 2.7 Correspondence table

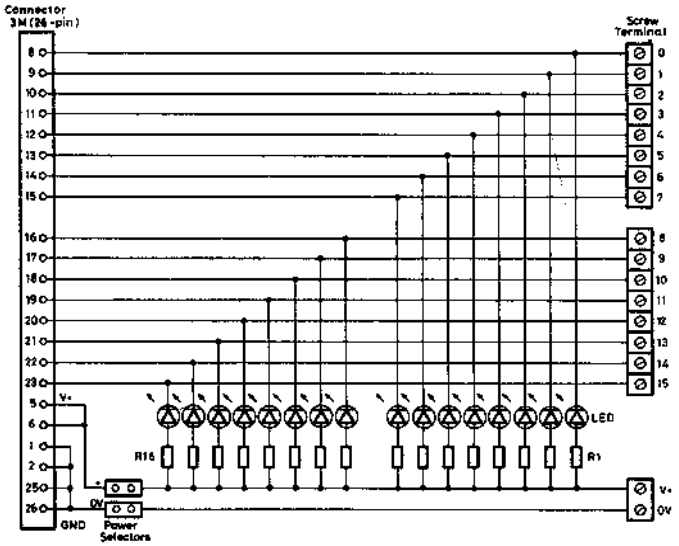
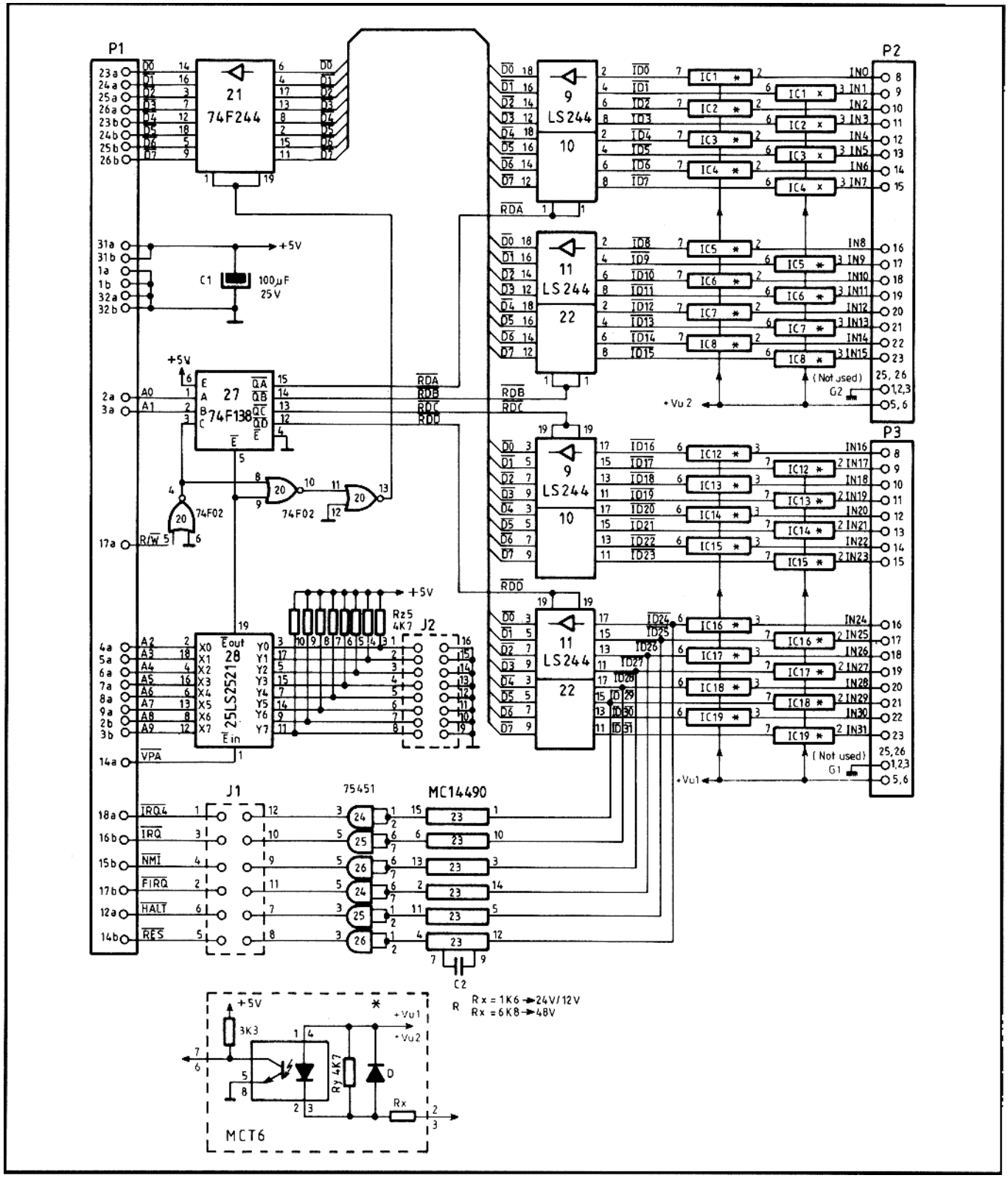


Fig. 2.2 GESICU-1A



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