

## 1. SPECIFICATIONS

The general description of the card is FADIBUS parallel to the description of the integrated circuit PCA9555N. The card provides 16 FADIBUS / O accessible via general purpose I2C/SMBus-400kHz with output capacity of 2'3-5v 50mA each. The card provides a simple solution FADIBUS and versatile with a need for inputs / outputs as controlled sources, sensors, buttons, LEDs, fans, etc..

Internally is forming for 2 ports of 8 bits each (puerto\_0 and puerto\_1) level independently configurable as inputs or outputs bit internal registers by \$ 6 to \$ 7. The bits configured as inputs can be changed or reversed polarity writing internal registers \$ 4 and \$ 5. To read the bits at ports configured as inputs must read records \$ 0 and \$ 1. To write to the ports configured as outputs bits must be written in the registers \$ 2 and \$ 3.

Any change in status bits set as inputs trigger an interrupt output to LOW, which is disabled by reading the port that housed the bit changing.

The return address on the I2C bus can be changed by modifying three switches A, B and C acting on the pins A0, A1 and A2 respectively PCA9555N. It is possible to connect up to 8 cards FADIBUS and have expanded to 256 inputs / outputs.

## 2. INTERNAL REGISTERS

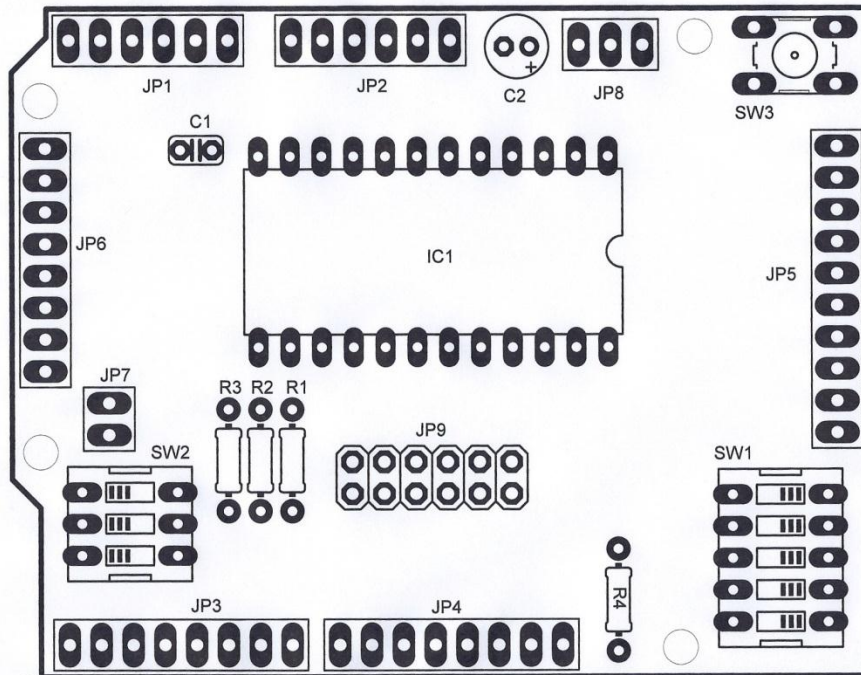
The internal registers are called as command byte.

Internal address	Function register	Normal operation
\$0	Input port 0	Lectura
\$1	Input port 1	Lectura
\$2	Output port 0	Escritura
\$3	Output port 1	Escritura
\$4	Polarity input port 0	Escritura
\$5	Polarity input port 1	Escritura
\$6	Configuration I/O port 0	Escritura
\$7	Configuration I/O port 1	Escritura

### 3. COMPONENTS LIST

PB <sub>1</sub>	1012 014	PCB FADIBUS
IC <sub>1</sub>	1002 500	PCA9555N.
SW <sub>1</sub>	1003 000	Push IQ level.
SW <sub>2</sub>	1012 503	Slide switch 3-way.
SW <sub>3</sub>	1012 505	Slide switch 5 way.
R <sub>1</sub> - R <sub>4</sub>	1002 472	1/4w 4.7KΩ resistance.
C <sub>1</sub>	1002 472	22μF 16V electrolytic capacitor 472.
C <sub>2</sub>	1002 472	100nF 50V ceramic capacitor.
Z <sub>1</sub>	1000 000	Socket DIP-0, 6 ".
JP <sub>1</sub> -JP <sub>2</sub>	1000 501	Pair of 6 and 8 tracks.
JP <sub>3</sub> -JP <sub>4</sub>	1000 501	Pair of 6 and 8 tracks.
JP <sub>5</sub>	1004 510	Connector 10-pin angled terminals.
JP <sub>6</sub>	1004 508	Connector 8-pin right angle pin terminals.
JP <sub>7</sub>	1004 102	Connector pin 2 right terminals.
JP <sub>8</sub>	1004 103	Connector pin 3 right terminals.
JP <sub>9</sub>	1004 212	Connector pin straight terminals.
S <sub>1</sub>	1003 001	Red Bridge.
S <sub>2</sub>	1003 002	Blue Bridge.

## 4. MAP OF COMPONENTS



## 5. SETTINGS CARD

### 5.1. Power supply card

The card can be powered FADIBUS or 3.3 v 5v. Given that the card provides PICAXE BASE SHIELD 5V or 3.3 V with a current of up 0'5A between the two, however ARDUINO 0'5A ONE-5v supply or 3.3 V-0'1A. It is therefore preferable to use 5v microcontrollers and feed FADIBUS the primary power supply (5V). In any case, FADIBUS fits both voltages and select the operating voltage with a red jumper JP8.

### 5.2. I2C adress of slave

FADIBUS is designed to respond to 16 addresses on the I2C bus, 8 locations if you consider that one is reading and writing another. SW2 through 8 can be selected locations, this is achieved by acting on the least significant bits of an internal address register PCA9555N:

SW2					
Adress I2C	\$ <sub>7</sub> -\$ <sub>4</sub>	A	B	C	\$ <sub>0</sub>
\$40-\$41	0100	0	0	0	r/w
\$42-\$43	0100	0	0	1	r/w
\$44-\$45	0100	0	1	0	r/w
\$46-\$47	0100	0	1	1	r/w
\$48-\$49	0100	1	0	0	r/w
\$4A-\$4B	0100	1	0	1	r/w
\$4C-\$4D	0100	1	1	0	r/w
\$4E-\$4F	0100	1	1	1	r/w

### 5.3. Activation of the interrupt.

The integrated circuit 9555N PCA automatically generates an interrupt when a change in the state on pins configured as input ports expanded.

Thus the microcontroller can respond immediately with a subroutine said change running interrupting the program routine and wherein the instructions are placed reading ports within the subroutine extended interruptions.

### 5.4. Pullup resistor.

Output interruption has two states: LOW level (interruption) and high impedance (no interruption), to obtain a HIGH level is connected to VCC interruption through resistor RS.

SW1-output RS interruption fixed to Vcc through a pullup resistor R4.

In the case of connecting multiple cards and have FADIBUS expansion up to 256 inputs / outputs, in this case can opt for hanging all interrupts with the same input (eg INT0), form groups or individualized attention interrupt each FADIBUS card, noting the only precaution that you should only be activated pullup resistor for each interrupt input.

5.5. Routing interrupt to the microcontroller.

Systems based on ARDUINO-A, PICAXE 28X2 and other interruptions to activate your changes B.0 entries, B.1 or B.2, which correspond to interrupts INTO, INT1 or INT2. Are also sensitive to changes and activate interrupt logic level in the puerto\_C, FADIBUS not allow direct interrupts since C.3 i are configured C.4 as SCL and SDA, but if the remaining bits of puerto\_C.

SW1 (I1, I2, I3 and PORTC) route the interrupt generated by the PCA9555N to INTO (B.0), INT1 (B.1), INT2 (B.2) or port C (C.0, C.1 , C.2, C.5, C.6 or C.7), in the latter case the auxiliary connector to route JP9 ends by a bridge port bit blue C (C.0, C.1, C.2 , C.5, C.6 or C.7) for.

Interruption by terminal:	SW1					JP9					
	I0	I1	I2	Port_C	R <sub>S</sub>	C <sub>7</sub>	C <sub>6</sub>	C <sub>5</sub>	C <sub>2</sub>	C <sub>1</sub>	C <sub>0</sub>
B.0	<b>on</b>				<b>on</b>						
B.1		<b>on</b>			<b>on</b>						
B.2			<b>on</b>		<b>on</b>						
C.0				<b>on</b>	<b>on</b>						<b>on</b>
C.1				<b>on</b>	<b>on</b>					<b>on</b>	
C.2				<b>on</b>	<b>on</b>				<b>on</b>		
C.5				<b>on</b>	<b>on</b>			<b>on</b>			
C.6				<b>on</b>	<b>on</b>		<b>on</b>				
C.7				<b>on</b>	<b>on</b>	<b>on</b>					