

ProArm Programming Interface and Handshake Protocol

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20 Pin Robot Connection (Female Connection to Robot)

"TO ROBOT" Label

K				L					
J	I	H	G	F	E	D	C	B	A

25 Pin LPT Connection (Male connection to Computer)

L (25)	L (24)	L (23)	L (22)	L (21)	L (20)	L (19)	-					
		K (11)	J (10)	I (9)	H (8)	G (7)	F (6)	E (5)	D (4)	C (3)	B (2)	A (1)

Pin Label	Pin #	Description	
A	1	STROBE	Low pulse clocks data from the computer to the ProArm. It signals the ProArm that another byte is ready or transfer If it is below more than 0.5 μ s, enable the Pro-Arm to receive the sent data.
B	2	D0	1 or 0 to build binary code from the computer Least Significant Bit (LSB)
C	3	D1	^
D	4	D2	^
E	5	D3	^
F	6	D4	^
G	7	D5	^
H	8	D6	^
I	9	D7	^ Most Significant Bit (MSB)
J	10	ACK	A Low digital pulse informs the computer that the last character has been received and that the Pro-Arm is ready to accept

			another character
K	11	BUSY	A High digital signal tells the computer that the Pro-Arm is not yet ready to receive the next byte of data
L	18-25	Ground	

Active signals at the low level appear with the negation bar (for example, Strobe). When indicated high or low refers to the voltage on the connector pin. High equals ~5V in TTL and low to ~0V in TTL.

Port protocol with printer

Handshaking ("handshake" or protocol) is a set of rules that both ends of a communication system have to follow for the communication to be correct. The parallel port, used with a printer, transmits data and transmits/receives protocol signals. The main ones are Strobe, Ack and Busy. The sequence to follow to send data would be:

1. Place the byte to send in the data register.
2. Check that the printer is not busy (Busy = low, S7 = 1).
3. Tell the printer to accept the data (Strobe = low, C0 = 1, pulse >5us).
4. At that moment the printer indicates that it is busy receiving the data (Busy = high, S7 = 0).
5. Finally, the printer sends an acceptance pulse indicating that the data has been received and that it is possible to return to step 1 (Ack = low, S6 = 0, pulse between 5 ms and 15 ms depending on the printer).

http://platea.pntic.mec.es/vgonzale/cyr_0204/cyr_01/robotica/index.htm

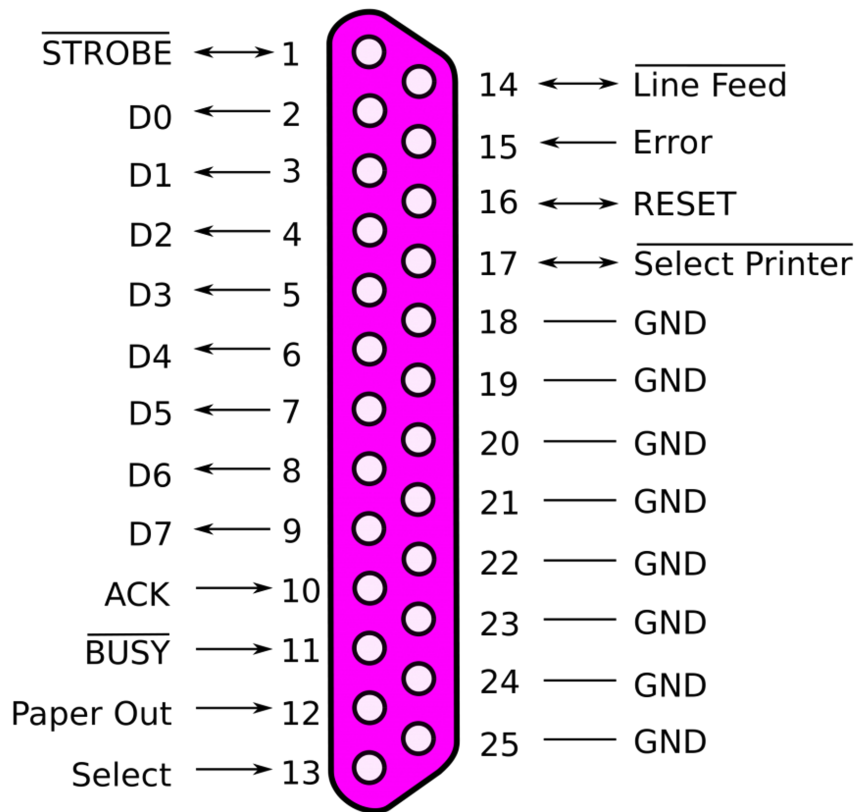
Also note

Extended and Enhanced Parallel Ports use additional hardware to generate and manage handshaking. To output a byte to a printer (or anything in that matter) using compatibility mode, the software must.

1. Write the byte to the Data Port.
2. Check to see if the printer is busy. If the printer is busy, it will not accept any data, thus any data which is written will be lost.
3. Take the Strobe (Pin 1) low. This tells the printer that there is the correct data on the data lines. (Pins 2-9)
4. Put the strobe high again after waiting approximately 5 microseconds after putting the strobe low. (Step 3)

Notes on the typical parallel port interface

Female receiver



Assumption:

- The pin information in the Pro-Arm manual is not conventionally recorded BUT the actual interface is conventionally wired.
- This is validated by my use of a Multimeter to determine continuities in the connector