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4.1. General

The Q10RS is an option card for RS232C interface and is used to support asynchronous and synchronous (SDLC.BY-SYNC) communication. The transfer speed can be set by the software, and is usable up to 19200 BPS in asynchronous mode. In this option card, the address can be changed by the jumper wires. Up to two cards at a time can be mounted on the option slot. As the Q10RS can support the 2-channel RS232C port, up to five channels can be mounted together with the standard RS232C port.

Cables:	For modem	#523
	For Null modem	#524
	Branched cable	#525

4.2. Hardware

4.2.1. General

The Q10RS uses the μ PD7201 as a serial controller, which supports asynchronous and synchronous communication. The counter timer μ PD8253-5 is also provided to supply transmission and reception clocks for the μ PD7201. The driver/receiver of RS-232C employs 75188/75189, and the supply voltage is ± 12 V.

The μ PD7201 has two transmission and reception channels A and B, which support up to two channels of RS-232C. The ID check circuit is also provided to check if the Q10RS card is mounted. Interface with CPU permits polling or interrupt.

4.2.2 Block diagram

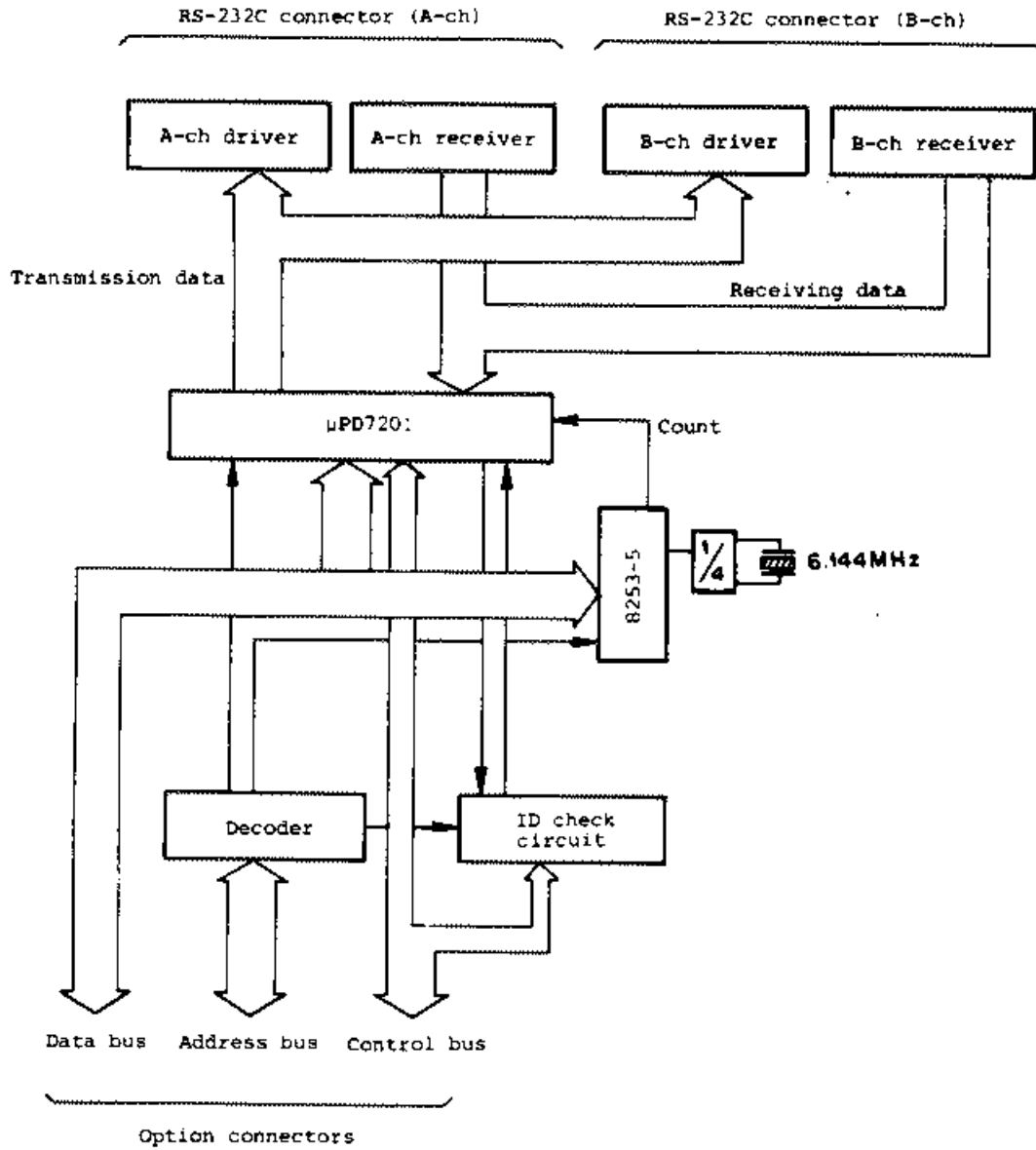


Fig. 4-1

4.2.3 RS-232C connectors

Pin No.	Signal name	Channel	Function	Remarks
1	AA (FG)	—	Safety ground	
2	BA (TXD)	A-ch	Transmission data	7201
3	BB (RXD)	A-ch	Receiving data	7201
4	CA (RTS)	A-ch	Transmission request	7201
5	CB (CTS)	A-ch	Transmission enable	7201
6	CC (DSR)	A-ch	Data connection finished	Read in LS367.
7	AB (SG)	—	Ground for signal	
8	CF (DCD)	A-ch	Carrier detection	7201
9		—		
10		—		
11	REV.	A-ch		Same as CD. Not provided in RS-232C specifications.
12	SCF (DCD)	B-ch	Secondary carrier detection	7201
13	SCB (CTS)	B-ch	Secondary transmission enable	7201
14	SBA (TXD)	B-ch	Secondary transmission data	7201
15	DB (TXC)	A-ch	Transmission clock	7201
16	SBB (RXD)	B-ch	Secondary receiving data	7201
17	DD (RXC)	A-ch	Receiving clock	7201
18	DSRB	B-ch	Data connection finished	Read in LS367. (Assigned by EPSON.)
19	SCA (RTS)	B-ch	Secondary transmission request	7201
20	CD (DTR)	A-ch	Data terminal ready	7201

21		—		
22	CE (RING IND)	Common	Call display	Read in LS367.
23	CH (DATA RATE)	Common	Transfer speed selection	Changed over with the dip switch.
24	DA (TXC)		Transmission clock	Output to modem.
25	DTR B	B-ch		7201 (Assigned by EPSON.)

Table 4-1 Locations of Q10RS connectors

The Q10RS option card includes up to the secondary channel (B-channel) of EIA RS-232C.

At these two channels can be independently controlled, two channels of RS-232C can be used by using a two-branched cable (#525), for example.

However, since secondary DTR and DSR are not defined in the RS-232C specifications, a complete two-channel system cannot be made as it were. So, DTR and DSR are assigned to pins 25 and 18 so that independent two channels of RS-232C can be used.

4.2.4 Setting of jumper wires

(1) Setting the interface signals

	Signal name	ON	OFF	Set at delivery
J1	SCB (Secondary CTS)	Pulled up	Not pulled up	ON
J2	SCF (Secondary CD)	Pulled up	Not pulled up	ON
J3	CF (DCD)	Pulled up	Not pulled up	ON
J4	CC (DSR)	Pulled up	Not pulled up	ON
J5	CB (CTS)	Pulled up	Not pulled up	ON

Table 4-2

(2) Setting communication modes

	Signal name	Asynchronous (set at delivery)	Synchronous	
			External clock used	Internal clock used
J6-A	External transmission clock	OFF	ON	OFF
J6-B	Internal transmission clock	ON	OFF	ON
J7-A	Internal receiving clock	ON	OFF	OFF
J7-B	External receiving clock	OFF	ON	ON

Table 4-3

(3) Address map (Option connectors)

J8-A	J8-B	
ON	OFF	Mapping addresses at 00A4 (H) - 00AF (H). (Set at delivery.)
OFF	ON	Mapping addresses at 00C4 (H) - 00CF (H).

Table 4-3

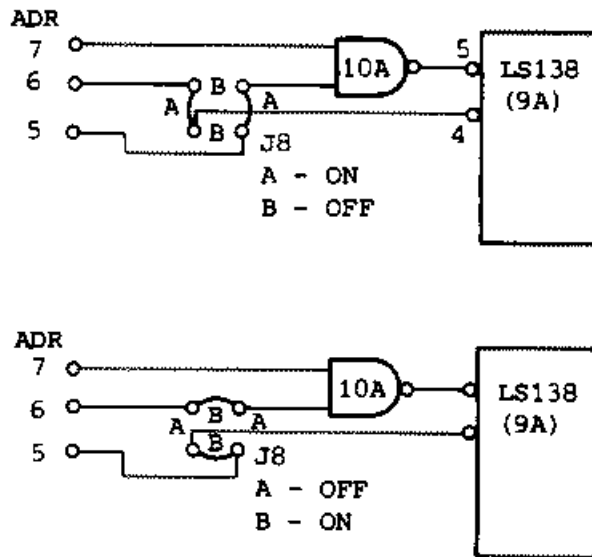


Fig. 4-2

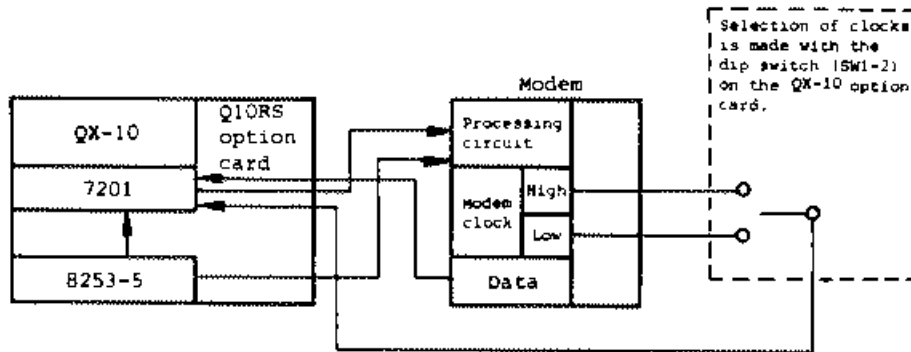
(4) Selecting transfer speeds (Modem clock)

	ON	OFF	Set at delivery
SW1-1	Meaningless		ON
SW1-2	Setting the channel to high level	Setting the channel to low level	ON
SW1-3	Not used		ON
SW1-4			ON

Table 4-4

When two Q10RS option cards are used in the option slot, setting of JB should be made different.

Reference:



There are two synchronous systems: one is to transmit a clock from the Q10RS option card (using the internal clock) and the other is to receive a clock from the modem (using the external clock). The asynchronous system does not perform transmission and reception of the external clock. The difference between the signals of A and B channels is shown together with pin numbers in the table below. As seen from the table, the pin of TXC.RXC (transmission clock·Reception clock) does not exist in B-channel.

This indicates that the modem (external) clock cannot be used. Therefore, when using the clock from the modem, use the A-channel. The jumper wires and dip switch should be set to accordingly.

Pin No.	Signal name	Color
1	CG	Shield
2	TXD (A)	Orange/Red
3	RXD (A)	Orange/Black
4	RTS (A)	Gray/Red
5	CTS (A)	Gray/Black
6	DSR (A)	White/Red
7	SG	White/Black
8	CD (A)	Yellow/Red
12	CD (B)	Yellow/Black
13	CTS (B)	Pink/Red
14	TXD (B)	Pink/Black
15	TXC	Orange/Red
16	RXD (B)	Orange/Black
17	RXC	Gray/Red
18	DSR (B)	Gray/Black
19	RTS (B)	White/Red
20	DTR (A)	White/Black
22	RING IND.	Yellow/Red
23	RATE SEL	Yellow/Black
24	TXC	Pink/Red
25	DTR (B)	Pink/Black

Pin No.	Signal name	Color
1	CG	Shield
2	TXD (A)	Orange/Red
3	RXD (A)	Orange/Black
4	RTS (A)	Gray/Red
5	CTS (A)	Gray/Black
6	DSR (A)	White/Red
7	SG	White/Black
8	CD (A)	Yellow/Red
11	DTR (A)	White/Black
15	TXC	Orange/Red
17	RXC	Gray/Red
20	DTR (A)	White/Black
22	RING IND.	Yellow/Red
23	RATE SEL	Yellow/Black
24	TXC	Pink/Red

B-channel connectors

Pin No.	Signal name	Color
1	CG	Shield
2	TXD (B)	Pink/Black
3	RXD (B)	Orange/Black
4	RTS (B)	White/Red
5	CTS (B)	Pink/Red
6	DSR (B)	Gray/Black
7	SG	White/Black
8	CD (B)	Yellow/Black
11	DTR (B)	Pink/Black
20	DTR (B)	Pink/Black

Table 4-5

4.3. Software

4.3.1 I/O MAP of Q10RS

I/O ports assigned for options are available in 80 (H) - FF (H). Among them, A4 (H) - AF and C4 (H) - CF (H) are assigned to Q10RS. This permits mounting of up to two cards at a time on the option slot by changing setting of the jumper wire (J8).

The I/O map is as shown below.

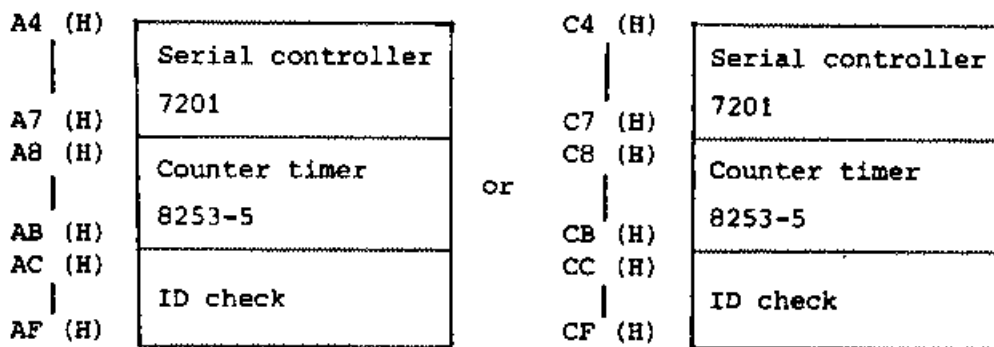


Fig. 4-6

4.3.2 ID check method

This is the method of checking whether or not the Q10RS option card exists on the option slot, and identifying the slot on which the Q10RS is mounted.

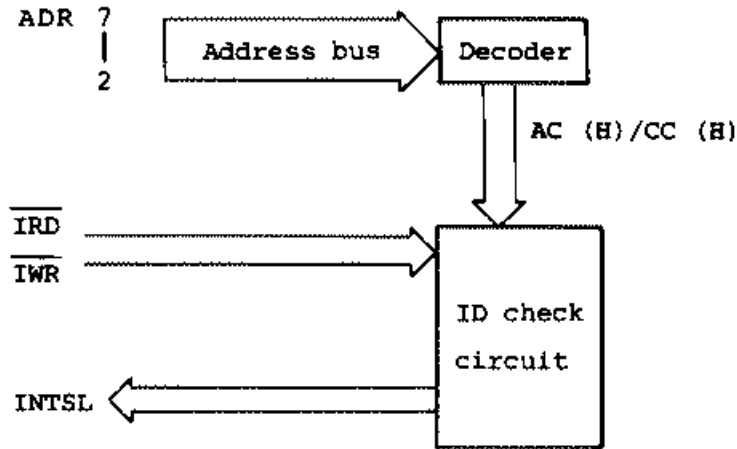


Fig. 4-7

Write optional data in AC (H) (any one of AC (H) - AF (H)) or CC (H) (any one of CC (H) - CF (H)). If the Q10RS option card has been mounted, the address corresponding to that slot number is interrupted. Existence of the card is indicated by it. The interrupt request is reset by reading AC (H) or CC (H) by the interrupt routine.

The contents of AC (H) and CC (H) are as follows.

DSR Ach	DSR Bch	RINGER	Always high			DIP SW	
D7	D6	D5	D4	D3	D2	D1	D0

With respect to DSR and RINGER, the bit becomes 0 when the RS-232C level is ON.

(As the Q10RS option board uses 75188/75189 as driver/receiver, the level is ± 15 V.)

The bit becomes 0 when the dip switch is ON.

The dip switch is connected to D0. The purpose of using the dip switch is to ascertain whether the Q10RS option card is asynchronously or synchronously set, and to start the support program accordingly.