Circuit board retro-fit kit instructions
100 mm recorders

These instructions refer to the retro-fitting of option boards to recorders manufactured after January 1997. For recorders manufactured prior to this date, it may be necessary to fit RFI grounding springs. Please consult the manufacturer for details.

The procedure varies according to how many boards are already fitted. In particular, if option board slots 1 and 2 are already used but slots 3 and 4 are empty, an extension card-guide must be fitted before any other 1/2-width (option) boards can be fitted. Figure 1a shows the inside of a 100mm recorder case, showing the locations of those components relevant to this document.

Notes:

1. Relay output boards and some versions of the event input board need an address to be set using a DIP switch (see tables 1a, 1b respectively).
2. Retransmission (analogue output) boards need an address to be set using links (see table 1c.)
3. Communications boards may be used only in option slot 2 or option slot 4
4. Communications boards have three links which select either RS232 or RS485 as the transmission standard (see figure 1b).
5. For graphics recorders only, options board slots three and four can be used for a second six-channel input board, allowing such recorders to be configured as 12-channel instruments.
6. Retransmission and communications options are not available for all 100 mm recorder models.

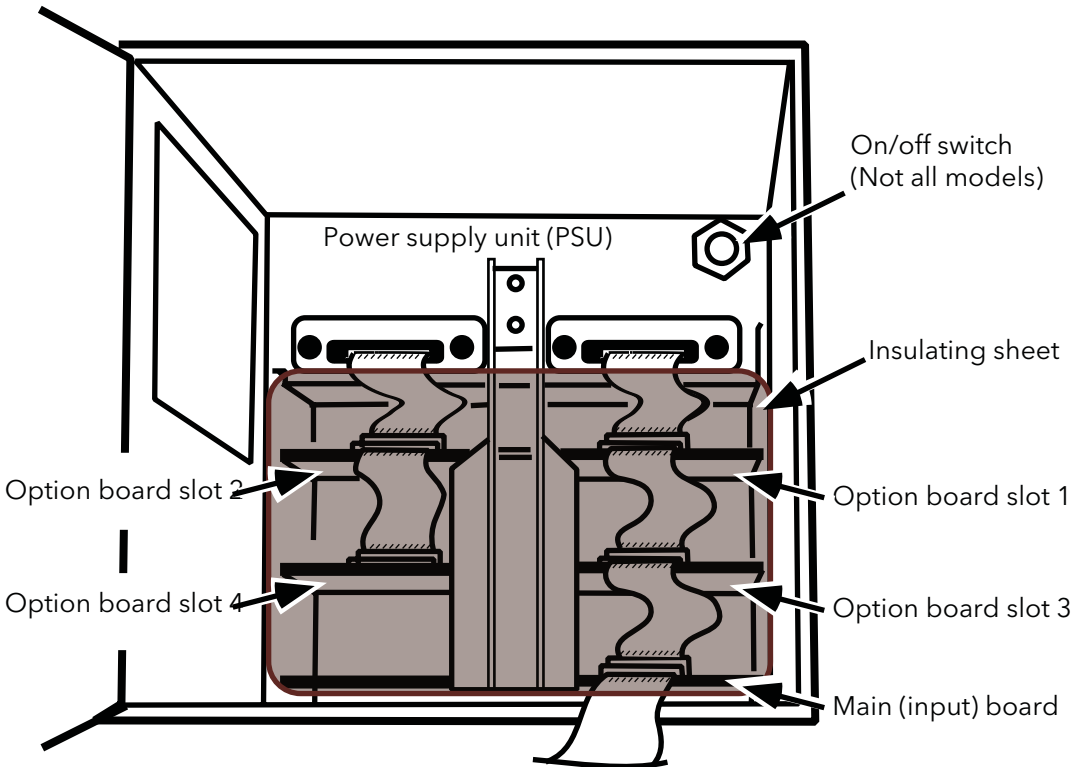

Figure 1a Option board slot locations (view from front of recorder case)

Relay board N	Switch element 1	Switch element 2
1	Up	Up
2	Down	Up
3	Up	Down
4	Down	Down

Table 1a
Relay board address settings

Event i/p board N	Switch element 1	Switch element 2
1	Up	Up
N/A	Down	Up
N/A	Up	Down
N/A	Down	Down

Table 1b
Event i/p board address settings

Retrans-mission board N	Links fitted 1	Links fitted 2
1	No	No
2	Yes	No
N/A	No	Yes
N/A	Yes	Yes

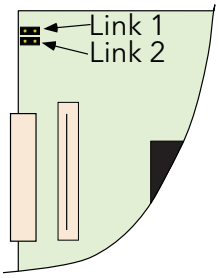

Table 1c
Retransmission board address link locations

Note: Not all event input boards have a switch fitted

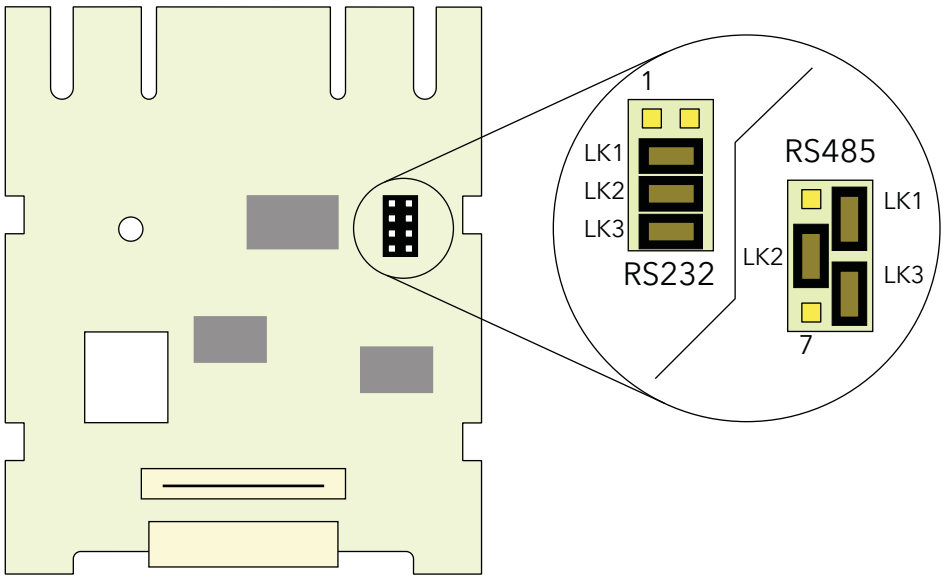

Figure 1b Communications board settings for RS232 or RS485

Note: Earlier versions of the communications option board did not have links fitted, and were suitable for use only with RS485.

CAUTION

This upgrade involves the handling of components which are sensitive to static electrical discharge. All relevant personnel must be aware of static handling procedures.

1. Isolate the recorder from all high-voltage sources (signal as well as supply).
2. Referring to the Installation and Operation Manual as necessary, open the recorder door and remove the cassette and (to prevent accidental skin or clothing contamination) the pens / printhead.
3. For non-graphics recorders, undo the screw (figure 2) which secures the recorder chassis to the case. Carefully withdraw the recorder from the case, and remove the flexi cable from its connector as shown in figure 3. This connector is made up of a fixed part and a moving clamp. The clamp should be gently prised away from the fixed part, until the flexi can be easily removed. Continue at step 5.

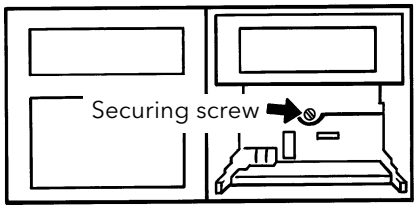

Figure 2a
Chassis securing screw (non-graphics recorders)

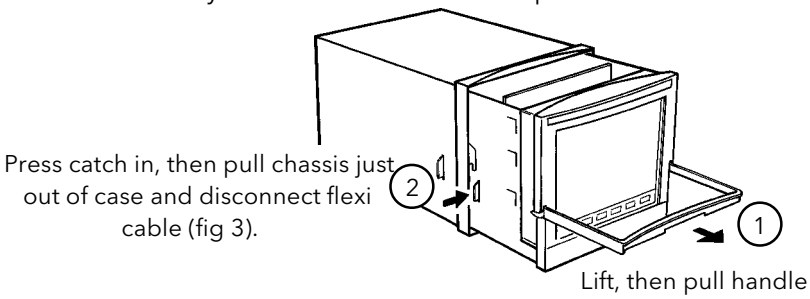

Figure 2b
Chassis removal (graphics recorders)

4. For graphics recorders, lift the handle, and slowly pull the recorder chassis out of the case, until the catch engages. Press the catch in and carefully withdraw the chassis from the case. Remove the flexi cable from its connector as shown in figure 3. This connector is made up of a fixed part and a moving clamp. The clamp should be gently prised away from the fixed part, until the flexi can be easily removed.
5. Remove the recorder fully from the case and place it to one side in a static safe environment.

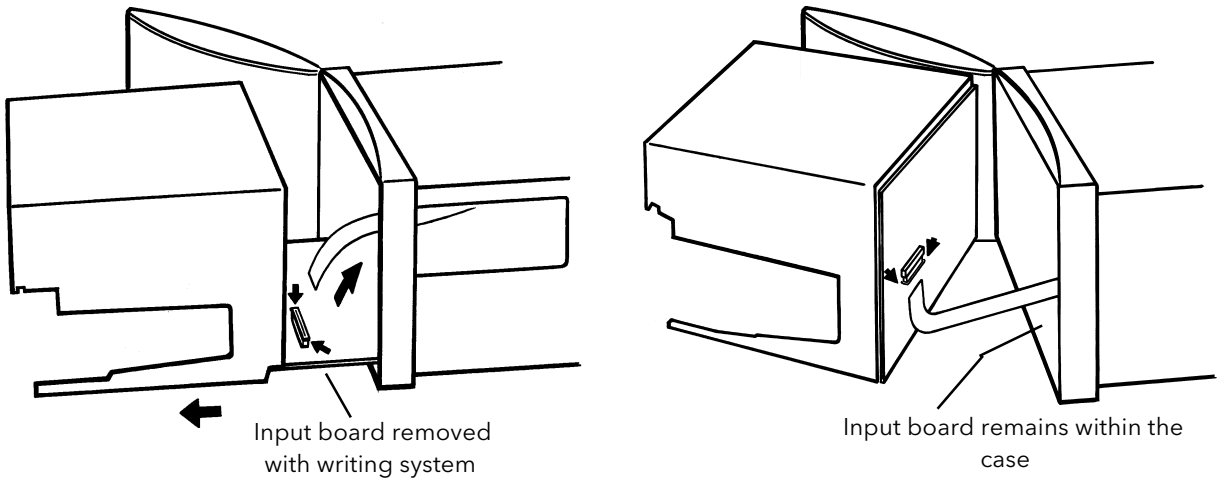

Figure 3 Flexi removal

Note: As can be seen from figure 3 above, flexi cable attachment and location of the input board varies with recorder model. For this reason, the flexi routing in your recorder may vary slightly from that shown, particularly in figures 4, 5 and 8.

6. Remove the circuit board retainer by undoing the screws (A in figure 4).
7. If you are fitting an additional input board (graphics recorders only) go to step 20, otherwise:

8. If other option boards are already fitted, go to step 10.
9. If no other option boards are fitted, as shown in figure 5, remove the power supply unit (PSU) connector cover (if fitted) by prising out the plastic rivets (B in figure 4), lift the PSU connector 'ears', and pull the 'flexi' cable out. Similarly, for models 4103 only, remove the other end of the flexi from the connector on the input board. If slot 3 is to be used for the first time, go to step 11, otherwise, continue at step 12.

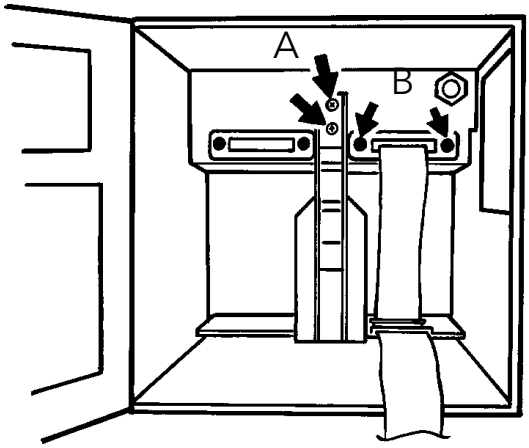

Figure 4
Remove board retainer and PSU connector cover
(For graphics recorders, remove insulating sheet first)

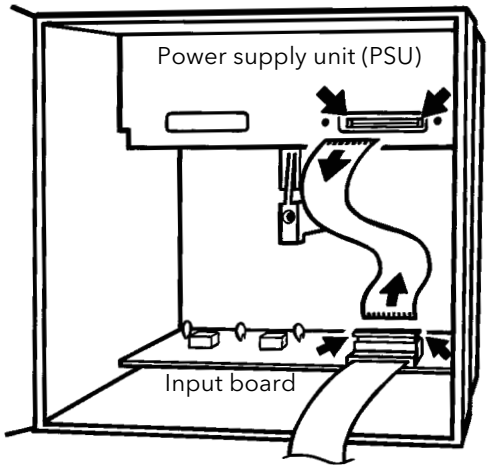

Figure 5
Remove flexi cable

10. If other option boards are already fitted:

    10a Option board in slot 1 only: take no action unless you are going to fit an option board in slot 3 in which case, remove the flexi joining option board 1 to the main/input board and go to step 11. If you are not fitting a board at slot 3, continue at step 13
    10b Option board in slots 1 and 2: remove flexi cable between option board 1 and the main/input board. Go to step 11.
    10c Option board in slots 1, 2 and 3: take no action. Continue at step 13.

11. Slide the square nut into the slot in the extension board guide. Fit the extension board guide, securing it with the M3 x10 mm screw provided (figure 6).

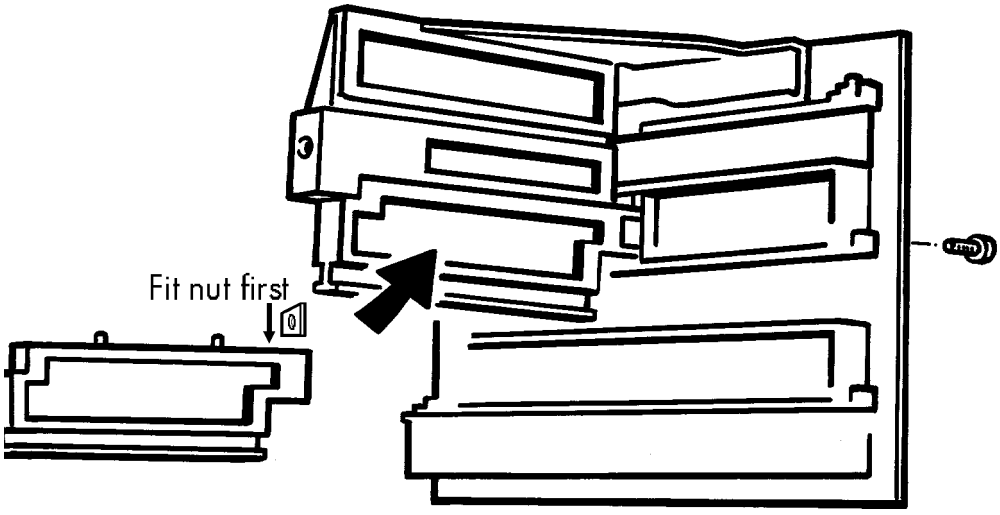

Figure 6 Fitting the circuit board guide extension

12. Remove relevant blanking plates and push fit the connectors until they click into place. Each connector has orientation lugs to prevent insertion the wrong way up. Figure 7 shows this process for option board slots 1 and 2. Clip the screwdriver guide into place, and fit the appropriate label to each connector (23 to 44 for the middle connector; 45 to 66 for the top connector).
13. Fit polarising keys as necessary (see table 2).
14. Set any necessary DIP switches (see figure 8 for location) or links, as shown in tables 1 (page 2).

Board type	Insert polarising pin between contacts			
	Slot 1	Slot 2	Slot 3	Slot 4
Retransmission	48 & 49	61 & 62	26 & 27	39 & 40
Event input	49 & 50	62 & 63	27 & 28	40 & 41
Relay	50 & 51	63 & 64	28 & 29	41 & 42
Serial comms	N/A	64 & 65	N/A	42 & 43
Profibus comms	N/A	64 & 65	N/A	42 & 43

Table 2 Polarising pin positions

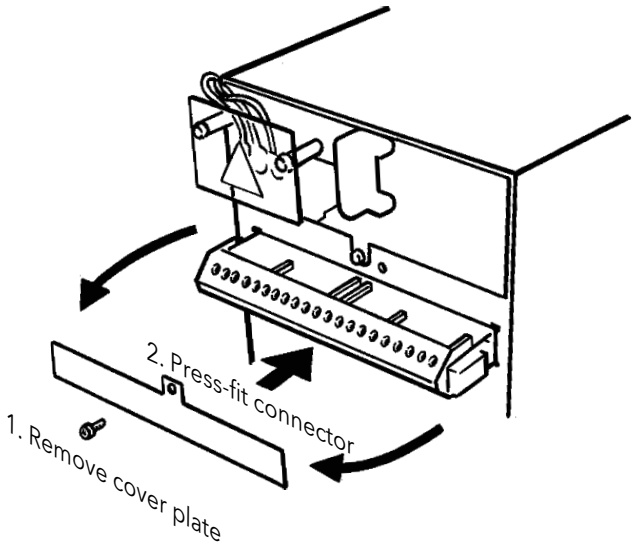

Figure 7 Remove blanking plate and fit connector block

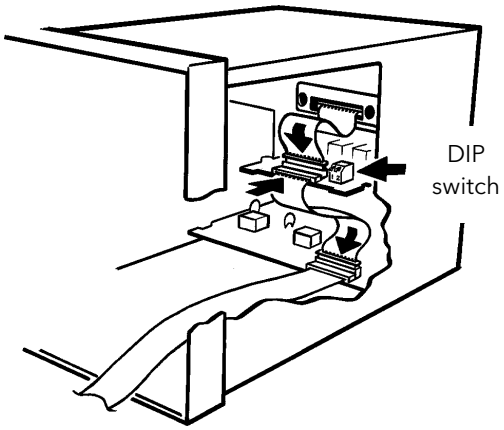

Figure 8 Set DIP switches and fit flexi cables

15. Fit the option board(s) to the relevant slot(s) and connect the necessary flexi cables (conductive surface upper-most) such that:
    - 15a Option board 1 is connected to the PSU and either option board 3 (if fitted) or to the main/input board, as shown in figure 8, if option board 3 is not fitted.
    - 15b Option board 2 (if fitted) is connected to the PSU and option board 4 (if fitted).
    - 15c Option board 3 (if fitted) is connected to option board 1 and to the main/input board.
    - 15d Option board 4 (if fitted) is connected to option board 2.

    Figure 1 on page 1 shows a full set of option boards and flexi cables for guidance.

16. If previously removed (step 9) re-fit plastic covers over the PSU connector slots securing them with plastic rivets.
17. Re-fit the board retainer (removed at step 6), and (for graphics units only) the insulating sheet.
18. Re-fit the recorder chassis to the case, ensuring that the flexi cable is properly fitted.
19. Re-fit the pens/printhead and chart cassette, carry out the relevant signal wiring and return the recorder to service.

To fit an extra input board providing channels 7 to 12 (graphics recorders only)

20. If there are option boards fitted in slots three and/or four, continue at step 21. If slots 3 and 4 are empty continue at step 23.

    The new input board occupies option slots three and four, so any option boards located in these slots must be removed as must the circuit board guide extension:

21. Remove all the flexi cables associated with all the option boards and store them in a safe place for use in later re-assembly. Pull any option boards in slots 3 and 4 forwards out of their connector and card guides. Store the cards in a static safe environment until such time as they are needed.
22. Undo the securing screw at the rear of the recorder and remove the circuit board guide extension as shown in figure 9. Continue at step 25.

23. If slots 3 and 4 are empty, and the circuit board guide extension is not fitted, continue at step 25. If the guide extension is fitted, remove it as described in step 22, then continue at step 24.

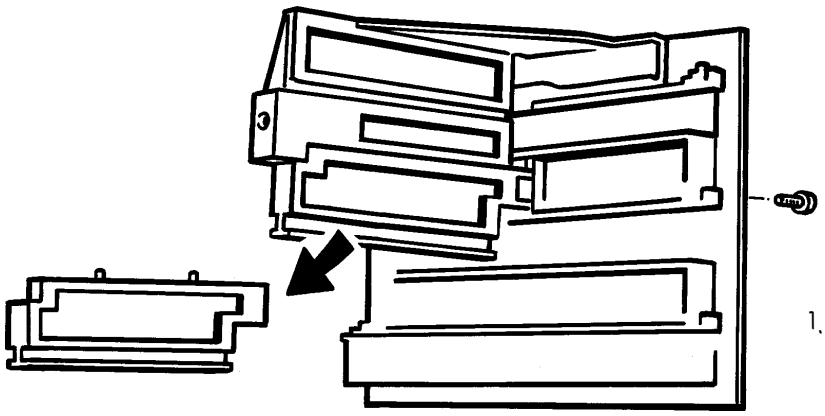

Figure 9 Removal of the circuit board guide extension

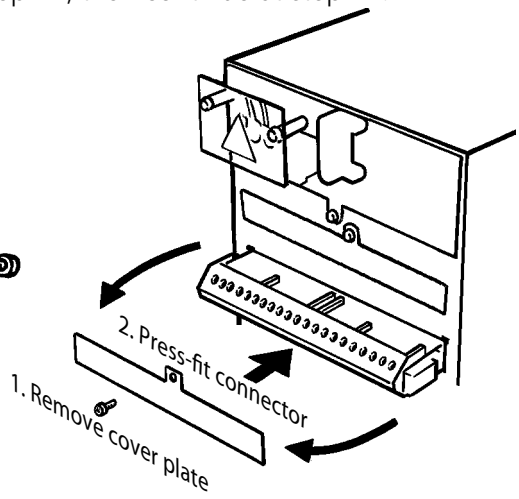

Figure 10 Fitting the connector

24. If not already fitted, fit the connector by removing the relevant blanking plate and push-fitting the connector until it clicks into place (figure 10). The connector has orientation lugs to prevent insertion the wrong way up. Clip the screwdriver guide into place, and fit the label to the connector (23 to 44).
25. Set the address link for board 2, as shown in figure 11, and slide the circuit board into place. Connect the necessary flexi cables (conductive surface (bright-ends) uppermost) as follows.

    If option board 1 IS fitted:
    25a PSU to option board 1 and Option board 1 to Input board 2
    If option board 1 is NOT fitted:
    25b PSU to input board 2
    In either case
    25c PSU to option board 2 (if fitted)
    25d Input board 1 to input board 2.
    25e Input board 1 to writing system
    Figure 12 shows two possible flexible cable layouts.

26. If previously removed (step 9) re-fit plastic covers over the PSU connector slots securing them with plastic rivets.
27. Re-fit the board retainer (removed at step 6), and (for graphics units only) the insulating sheet.
28. Re-fit the recorder chassis to the case, ensuring that the flexi cable is properly fitted.
29. Re-fit the pens/printhead and chart cassette, carry out the relevant signal wiring and return the recorder to service.

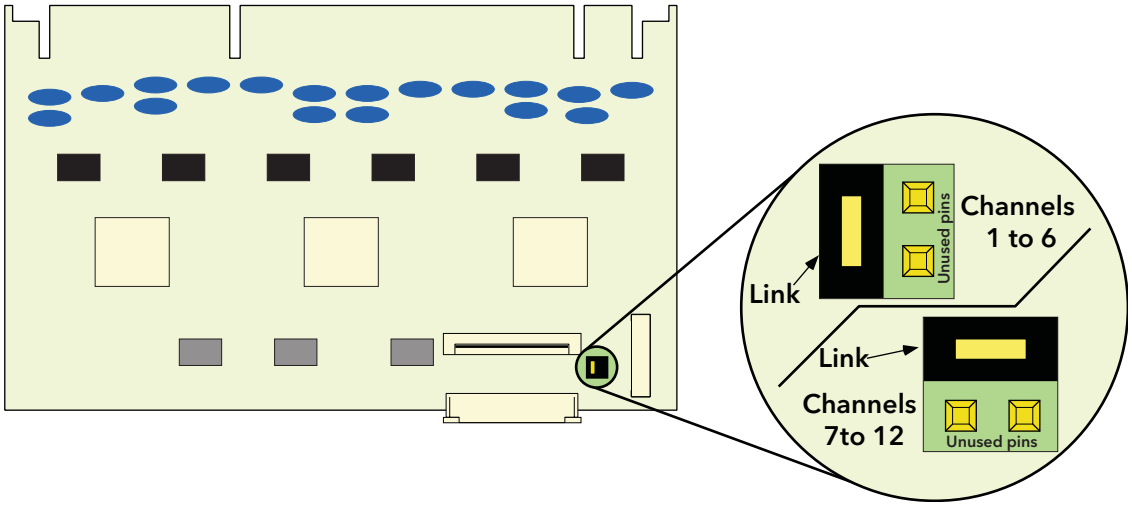

Figure 11 Input board link setting positions

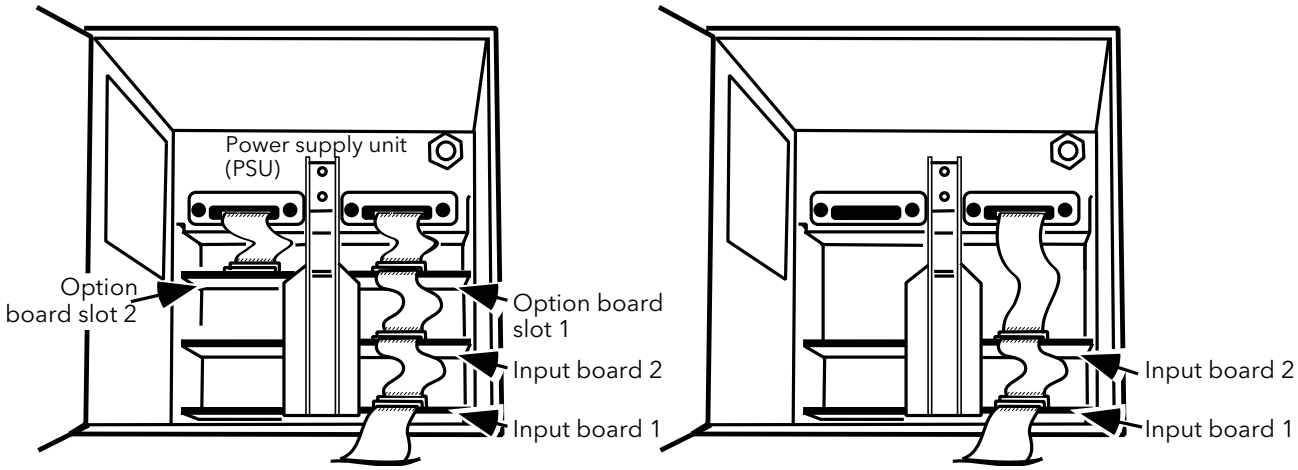

Figure 12 Typical flexi-cable layouts

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