



TRM Interconnect Card PMC4

www.trminternational.com

Table of Contents

Safety.....	3
Overview.....	5
Installing the Interconnect Board for the first time.....	5
Interconnect Board Terminations.....	7
Interconnect Board J1 Connector (37 way).....	7
Interconnect Board J2 Connector (44 way).....	8
Encoder Connections.....	9
J4 Connector.....	9
J6 Connector.....	9
J19 Connector.....	9
J22 Connector.....	9
J23 Connector.....	9
Other Connections.....	10
J24 Connector.....	10
J11,12,20,21 Connectors.....	10
J13 Connector (Emergency stop).....	10
J14 Connector (DC Drive Power Supply).....	10
J15 Connector (Start/Stop).....	11
OFF Connector.....	11
SOL_COM Connector.....	11
MAINS Connector.....	11
TX connector.....	11
J18 Connector.....	12
J16 Programming Port.....	12
Fuse Ratings.....	12
I/O connections.....	13
AUX_OP connector (TTL outputs).....	13
OUTPUTS connector.....	13
INPUTS A Connector.....	13
INPUTS B Connector.....	13
ADC_IN Connector.....	14
J7 Connector.....	15
J8 Connector.....	15
J9 Connector.....	15
J10 Connector.....	15
Troubleshooting the Interconnect Board.....	16
PROBLEM: System is not turning on.....	16
PROBLEM: Motor is not moving.....	16
Dimensional Drawing.....	17
Connector Layout.....	18



Safety

Warning! Only a competent Electrician may install this system.

Warning! Dangerous voltages are present when mains supply is connected.

Warning! Even when the motor is stopped there are dangerous voltages present at Power Circuit terminals.



TRM Interconnect Board Installation Guide

Thank you for choosing **TRM**. TRM products are designed for industrial machines and to give trouble free maintenance for many years.

IMPORTANT INFORMATION FOR USERS

The installation, set-up, test and maintenance procedures given in this user guide should only be carried out by competent personnel trained in the installation of electronic and mechanical equipment. Such personnel should be aware of the potential electrical and mechanical hazards associated with mains powered equipment and with the current regulations in force in your locality.

CE Marking

TRM interconnect board complies with the requirements of the European

- Low Voltage Directive 73/23/EEC with amendments
- EMC Directive 89/336/EEC with amendments

Overview

The TRM Interconnect Board is intended to simplify wiring and to ease the installation for OEM's. The board can be powered from 240 VAC/50 Hz or 120 VAC/60 Hz.

The Interconnect Board provides 24 Volts for the motion controller and external sensors etc. and also the power supply for the DC servo amplifiers to run the motors using an external transformer of up to 55 V AC in the secondary. Screw connectors are used for connecting the Inputs/Outputs for a fast connection.

The encoders can be connected in two ways using screw terminals or a crimp connector however we recommend for on-site termination the screw terminals be used unless the correct crimp tooling is available. The connection between the interconnect board and the motion controller is through 2 D-type connectors. D-type connector cables from the interconnect board to the controller can be provided at point of order in different lengths to suit the machine.

The interconnect board **must** be used with an external noise filter.

Installing the Interconnect Board for the first time

IMPORTANT

On the interconnect board all connectors have a dot on a corner which signals the starting pin No.1 for the specific connector.

On the following pages the user will find a pin description for all the Interconnect Board connectors, below is a general overview of the connectors normally used:

1. Start and Stop switches

Use connector J15 (see drawing on the last page) to connect a normally closed (NC) stop switch into the pins 1 and 2. Connect a normally open (NO) switch into pins 3 and 4.

2. Emergency Stop Switch

Use connector J13 to connect the Normally Closed (NC) pins of the Emergency Stop switch to pins 1 and 2.

3. Inputs and Outputs (Home switches, sensors etc.)

The Interconnect Board has screw connectors for all inputs and outputs but it has also 4 crimp connectors for inputs 0-3 which have a series resistor in the supply should protection be needed.

4. Motor(s) supply connection to the Drive(s)

J14 is the DC supply connector that should be wired to each Drive, please bare in mind the current capacity of the wires and the connector when terminating to

this connector.

5. Encoder(s) connection

The board provides connection for 4 encoders on J4,6,19 and 22. These allow A, B, /A and /B to be connected along with their +V and 0V supplies. If Z pulses are to be used then connector J23 is provided to connect the Z pulse from Each axis. /Z if available should be insulated and tied back as it is not used.

6. Verify all the following connectors are plugged in:

From Interconnect Board Connectors	To
J1 (D-Type Connector)	37 way D-Type connector Motion Controller
J2 (D- Type Connector)	44 way D-Type connector Motion Controller
J4	Encoder Axis 0
J6	Encoder Axis 1
J19	Encoder Axis 2
J22	Encoder Axis 2
J23	Encoder Z pulse Connections
J11	Drive Command axis 0
J12	Drive Command Axis 1
J20	Drive Command Axis 2
J21	Drive Command Axis 2
J13	Emergency Stop
J14	Drive(s) power
J15 (pins 1 and 2)	Stop switch
J15 (pins 3 and 4)	Start Switch
MAINS (6 pin green connector)	Mains in from Noise Filter
TX (5 pin green connector)	Transformer Primary
J18 DC IN	Transformer Secondary via rectifier

- Verify the sensors and switches are connected to the inputs.
- Verify the outputs are connected.
- Link pin 1 and 2 of the OFF connector on the interconnect board if a NC (normally closed) OFF power button is not used.
- Link pin 1 and 2 of the SOL_COM connector on the interconnect Board if no other supply is to be used for the output drivers.

Interconnect Board Terminations

Interconnect Board J1 Connector (37 way)

Pin	Label	Description
1	GND	24 Volt Supply Ground (0V)
2	+24V	24 Volt supply
3	VDDIO	Driver Output Supply Connection
4	VDDIO	
5	VDDIO	
6	VDDIO	
7	VDDIO	
8	DRV 8	Driver Output 8
9	DRV 9	Driver Output 9
10	DRV 10	Driver Output 10
11	DRV 11	Driver Output 11
12	DRV 12	Driver Output 12
13	DRV 13	Driver Output 13
14	DRV 14	Driver Output 14
15	DRV 15	Driver Output 15
16	DRV 16	Driver Output 16
17	DRV 17	Driver Output 17
18	DRV 18	Driver Output 18
19	DRV 19	Driver Output 19
20	GND	24 Volt Supply Ground
21	+24V	24 Volt Supply
22	IP0	Digital Input 0
23	IP1	Digital Input 1
24	IP2	Digital Input 2
25	IP3	Digital Input 3
26	IP4	Digital Input 4
27	IP5	Digital Input 5
28	IP6	Digital Input 6
29	IP7	Digital Input 7
30	IP8	Digital Input 8
31	IP9	Digital Input 9
32	IP10	Digital Input 10
33	IP11	Digital Input 11
34	IP12	Digital Input 12
35	IP13	Digital Input 13
36	IP14	Digital Input 14
37	IP15	Digital Input 15

Interconnect Board J2 Connector (44 way)

Pin number	Label	Description
1	CHA0	Encoder Channel 0 - 'A' Signal
2	CHB0	Encoder Channel 0 - 'B' Signal
3	Z0	Encoder Channel 0 - 'Z' Signal
4	CHA1	Encoder Channel 1 - 'A' Signal
5	CHB1	Encoder Channel 1 - 'B' Signal
6	Z1	Encoder Channel 1 - 'Z' Signal
7	CHA2	Encoder Channel 2 - 'A' Signal
8	CHB2	Encoder Channel 2 - 'B' Signal
9	Z2	Encoder Channel 2 - 'Z' Signal
10	CHA3	Encoder Channel 3 - 'A' Signal
11	CHB3	Encoder Channel 3 - 'B' Signal
12	CHZ3	Encoder Channel 3 - 'Z' Signal
13	STP0/TTL1	Ouput 1 (TTL)
14	STP2/TTL5	Ouput 5 (TTL)
15	GND	Ground (0V)
16	+5V	Encoder Supply (5 Volt output)
17	CHA0N	Encoder channel 0 - 'A\' Signal
18	CHB0N	Encoder channel 0 - 'B\' Signal
19	AGND	Ground (0V)
20	CHA1N	Encoder channel 1 - 'A\' Signal
21	CHB1N	Encoder channel 1 - 'B\' Signal
22	+5V	Encoder Supply (5 Volt output)
23	CHA2N	Encoder channel 2 - 'A\' Signal
24	CHB2N	Encoder channel 2 - 'B\' Signal
25	GND	Ground (0V)
26	CHA3N	Encoder channel 3 - 'A\' Signal
27	CHB3N	Encoder channel 3 - 'B\' Signal
28	GND	Ground (0V)
29	STP1/TTL3	Ouput 3 (TTL)
30	STP3/TTL7	Ouput 7 (TTL)
31	MC0	Motor Command O/P 0
32	MC1	Motor Command O/P 1
33	MC2	Motor Command O/P 2
34	MC3	Motor Command O/P 3
35	ADC0	Analogue Input (optional)
36	ADC1	Analogue Input (optional)
37	ADC2	Analogue Input (optional)
38	ADC3	Analogue Input (optional)
39	DIR0/TTL0	Ouput 0 (TTL)
40	DIR1/TTL2	Ouput 2 (TTL)
41	DIR2/TTL4	Ouput 4 (TTL)
42	DIR3/TTL6	Ouput 6 (TTL)
43	ENA C	Enable Signal Collector
44	ENA E	Enable Signal Emitter

Encoder Connections

J4 Connector

(Green, screw terminal, Encoder Axis 0)

Pin	Description
1	Vcc
2	Channel A0
3	Channel B0
4	Channel /A0
5	Channel /B0
6	GND

J6 Connector

(Green, screw terminal, Encoder Axis 1)

Pin	Description
1	Vcc
2	Channel A1
3	Channel B1
4	Channel /A1
5	Channel /B1
6	GND

J19 Connector

(Green, screw terminal, Encoder Axis 2)

Pin	Description
1	Vcc
2	Channel A2
3	Channel B2
4	Channel /A2
5	Channel /B2
6	GND

J22 Connector

(Green, screw terminal, Encoder Axis 3)

Pin	Description
1	Vcc
2	Channel A3
3	Channel B3
4	Channel /A3
5	Channel /B3
6	GND

J23 Connector

(Green, screw terminal, Encoder Z signal connections)

Pin	Description
1	Z0

2	Z1
3	Z2
4	Z3

Notes:

- If an axis is not in use please link A and /A to 5 V and B and /B to 0 V

Other Connections

J24 Connector

(Green, screw terminal, Supply Connections)

Pin	Description
1	+24VDC Out
2	+24VDC Out
3	+24VDC Out
4	GND
5	GND
6	GND

J11,12,20,21 Connectors

Motor Command Axis 0,1,2,3 - Please use Screened Cables

Pin	Description
1	MC0 (+/- 10 V Analogue Output)
2	Analogue Ground
3	Enable Signal (Pulls Low)
4	Enable Signal (Pulls High)
5	n/c
6	GND
7	n/c
8	n/c

J13 Connector (Emergency stop)

Use the normally Closed (NC) Connection on the Emergency Stop Connector for the first 2 pins and Normally Open (NO) connection for the 3rd and 4th pins (IP5 and GND) as shown below.

Pin	Description
1	Emergency Stop (NC)
2	Emergency Stop (NC)
3	No connect (Input 5)
4	No connect (GND)

Note: IP5 is an optional input to alert the system that the ESTOP is pressed.

J14 Connector (DC Drive Power Supply)

Power cable: form J14 to DC Drive.

Pin	Description
1	+Vcc

2	+Vcc
3	+Vcc
4	GND
5	GND
6	GND

J15 Connector (Start/Stop)

Pin	Description
1	Stop switch (NC)
2	Stop switch (NC)
3	Start switch (NO)
4	Start switch (NO)

OFF Connector

The OFF connector can be wired to a NC button to enable the operator to power off the system. If a button is not required please link this out.

Pin	Description
1	Off signal
2	Off signal

SOL_COM Connector

A connector is provided to enable the installer to select a different voltage to power the outputs with. If the standard 24V is to be used link pin 1 with pin 2.

Pin	Description
1	24 Volts
2	SOL_COM

MAINS Connector

Connections from external Noise Filter to interconnect board mains.

Pin	Description
1 - L	Live
3 - N	Neutral
5,6 - E	Earth

TX connector

TX Connector board (orange connector 5 pins) to primary winding of the transformer.

Pin	Description
1	Neutral
2	No pin
3	TXR (no snubber)
4	No pin
5	TX live (PTC snubber)

Note: on the TX pin we have incorporated a snubber device to reduce inductive power spikes occurring. After a few seconds a relay shorts this device out preventing it from



heating up under normal load.

J18 Connector

For the Connection of rectified transformer's secondary winding.

Pin	Description
1	DC from Drive supply rectifier
2	DC from Drive supply rectifier

The Transformers secondary winding should be taken to a correctly rated rectifier and then terminated to this connector. Do not connect AC directly to this connector. Large smoothing capacitors are fitted on-board.

J16 Programming Port

This is a special connector and should not be used for ANY connections.

I/O connections

AUX_OP connector (TTL outputs)

Pin	Description
1	TTL0 5V Signal Output
2	TTL1 5V Signal Output
3	TTL2 5V Signal Output
4	TTL3 5V Signal Output
5	TTL4 5V Signal Output
6	TTL5 5V Signal Output
7	TTL6 5V Signal Output
8	TTL7 5V Signal Output
9	GND
10	GND

OUTPUTS connector

Pin	Description
1	Driver Output 8
2	Driver Output 9
3	Driver Output 10
4	Driver Output 11
5	Driver Output 12
6	Driver Output 13
7	Driver Output 14
8	Driver Output 15
9	Driver Output 16
10	Driver Output 17
11	Driver Output 18
12	Driver Output 19

INPUTS A Connector

Pin	Description
1	GND
2	GND
3	Digital Input 0
4	Digital Input 1
5	Digital Input 2
6	Digital Input 3
7	Digital Input 4
8	Digital Input 5
9	Digital Input 6
10	Digital Input 7

INPUTS B Connector

Pin	Description
1	GND
2	GND
3	Digital input 8
4	Digital input 9
5	Digital input 10
6	Digital input 11

7	Digital input 12
8	Digital input 13
9	Digital input 14
10	Digital input 15

NOTE:

When using the interconnect board the software uses the following Inputs and Outputs so we advise the user to avoid using them for any other purpose:

Configurable Input 4 (IP4) = OK signal from the PLD

Configurable Input (IP5) = Emergency Stop Switch

General Output 7 (TTL7) = Enable output from Controller

ADC_IN Connector

(Black, crimp terminal, Analogue Input Connections)

Pin	Description
1	+5DC Out
2	ADC0 In
3	ADC0 In
4	ADC0 In
5	ADC0 In
6	Analogue GND

J7 Connector

Configurable Input 0

Note: For inputs 0, 1, 2, 3, the user can select between J7, J8, J9, J10 connectors or pins 3, 4, 5, 6 in the INPUTS A connector. The Molex KK header connections have limiting resistors in the supply rail as protection from noise and short circuits.

Pin	Description
1	24 Volts
2	No pin
3	Signal to input 0
4	GND

J8 Connector

Configurable Input 1

Pin	Description
1	24 Volts
2	Signal to input 1
3	GND
4	No pin

J9 Connector

Configurable Input 2

Pin	Description
1	24 Volts
2	Signal to input 2
3	No pin
4	GND

J10 Connector

Configurable Input 3

Pin	Description
1	No pin
2	24 Volts
3	Signal to input 3
4	GND

Troubleshooting

Fuse Ratings

Fuse size is 20mm Glass and are classed as Time delay/Slow Blow

FS1 - T6.3A

FS2 - T160mA

FS3 - T1A

FS4 - T500mA

PROBLEM: System is not turning on

- Verify the mains cable is connected to the right plug
- Verify the voltage selector is in the correct position (120 or 240 Vac).
- Verify the STOP and Emergency STOP buttons are released.
- Verify all fuses are OK.
- Verify STOP and Emergency STOP contacts are NC type

PROBLEM: Motor is not moving

Open the cabinet and verify the following:

- Verify voltage between Live and Earth and Live and ground.
- Verify the 5 Volts, 24 volts and Vcc LED's on the interconnect board are all turned on.
- Verify TTL7 is 5 Vdc (referred to ground) after pressing the START switch.
- Verify the connectors are all firmly in place.
- Verify Input 4 on the interconnect board turns from 5V to 0V (referred to ground) when pressing START switch.
- Verify all fuses are good.
- Verify there is continuity on J13 connector between both ESS terminals (pins 1,2).
- Verify there is continuity on J15 connector between pins 1 and 2.
- Verify the DC IN connector wires are tight and voltage between terminals should be around 77 Vdc for a 55 Vac transformer.
- Verify the output voltage on the J2 Drive connector pins 5 and 6, if there is output voltage but the motor is still not moving the problem is in the motor, motor cable or motor connection.

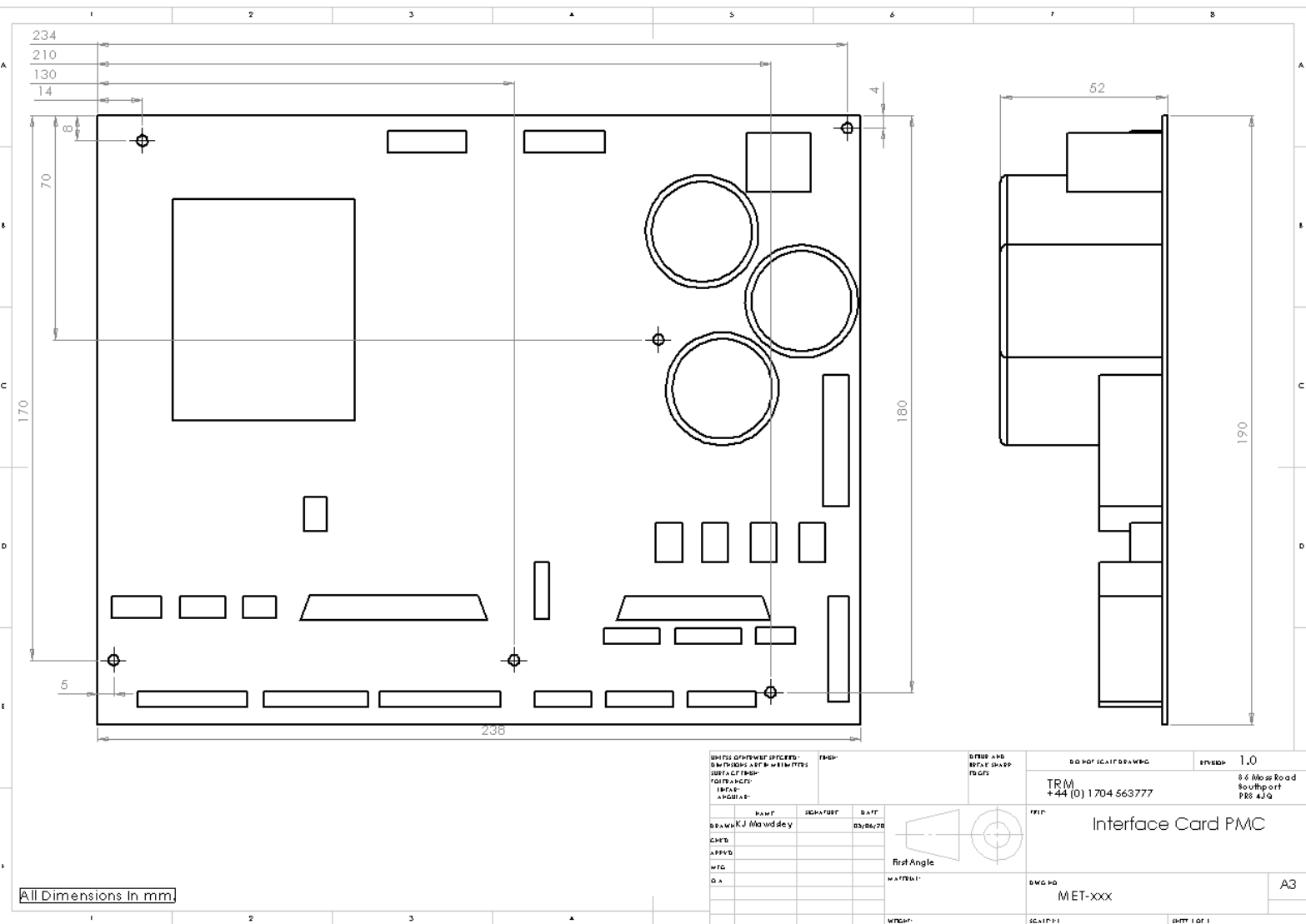


If when pressing start button the motors seem to start moving but when releasing the button the system trip out, probably the start button is wired to the stop pins and the Stop button is wired to the start pins. Verify connections on the J13 and J15 connectors.

Additional checks if the motor is still not moving

- Verify drive connections
- Verify encoder connections
- Verify drive current limit, gain and offset.

Dimensional Drawing



Copyright © 2014 Pearson Education, Inc. or its affiliate(s). All rights reserved.

