

# Technical Description

MEW00914

Revision 3

## ***I/O Matrix board 4582***

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# 1 Introduction

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This document<sup>1</sup> describes the I/O Matrix board 4582.

The I/O Matrix board 4582 is an interface between an EBL512 / EBL128 C.i.e. and an application board for some other Control and indicating panel, e.g. Generic, Fan or Zone Control and indicating panels, among other things required according to Australian and New Zealand standards.

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<sup>1</sup> Original file name: L:\User documents\512\Doc\Australia\MEW00914 (Rev 3).doc

## 2 Definitions / Explanations

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Definitions / explanations / abbreviations / etc. frequently used or not explained elsewhere in the document.

**C.i.e.** Control and indicating equipment = C.U.

**C.U.** Control Unit = CU = C.i.e.

**S/W** Software

**H/W** Hardware

**FCP** Fan Control Panel

**Generic c.i.p.** Generic control and indicating panel

**Fan c.i.p.** Fan control and indicating panel

**Zone c.i.p.** Zone control and indicating panel

### 3 General description

The I/O Matrix board 4582 is a LED output interface (a 48 LEDs matrix) and a switch input interface (a 16 inputs matrix). It has to be used together with an Application board, e.g. a Fan c.i.p. board, a Generic c.i.p. board or a Zone c.i.p. board.

The Application board with the I/O Matrix board 4582 is normally mounted in a separate housing, except in Australia and New Zealand.

The Application board is connected to an EBL COM loop<sup>2</sup> and 24 V DC power supply.

To the Application board respectively can for example be connected:

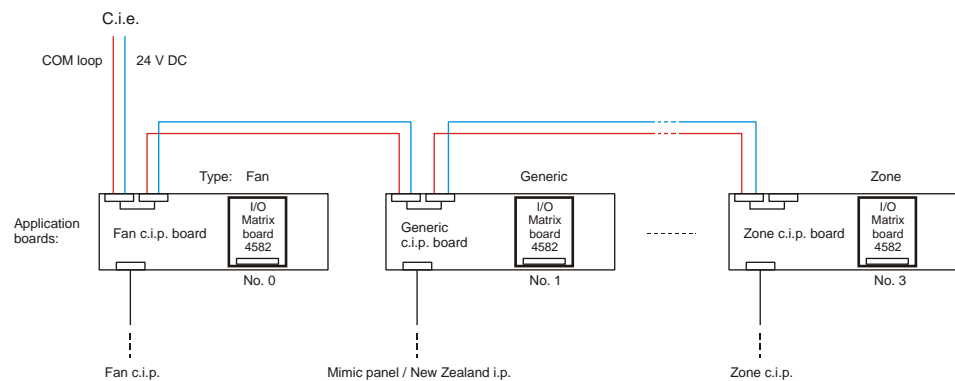
- Fan control panels<sup>3</sup>
- Mimic panels / New Zealand indicating panels
- Zone control and indicating panels

The I/O Matrix board 4582 has to be added via Win512 / Win128 / WinG3 and programmed. Among other things:

- Type
  - Generic<sup>4</sup>
  - Fan control
  - Zone control
- I/O Matrix board no. on the COM loop

Depending on the selected type:

- How each LED (output 0-47) shall be used
- How each switch (input 0-15) shall be used



**Figure 1. I/O Matrix board 4582 application overview. The COM loop and 24 V DC are internally connected to the I/O Matrix board. Valid for systems EBL512, EBL512 G3 and EBL128.**

<sup>2</sup> No COM loop address will be occupied.

<sup>3</sup> In this case, each fan is connected via a Multipurpose I/O unit 3361.

<sup>4</sup> This mode is used for a Mimic panel or a New Zealand indication panel.

## 4 I/O Matrix board

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The I/O Matrix board 4582 is an interface between an EBL C.i.e. (COM loop) and various types of **Application boards**<sup>5</sup>:

- **Generic** control and indicating panel board
- **Fan** control and indicating panel board
- **Zone** control and indicating panel board

See chapter "Application boards", page 10.

The number of I/O Matrix board 4582 that can be used in the system respectively:

### **EBL512**

Up to 4 I/O Matrix board 4582 per COM loop can be used, i.e.  $4 \times 4 = 16$  I/O Matrix board 4582.

### **EBL128**

Up to 8 I/O Matrix board 4582 on the COM loop can be used.

**NOTE!** For each exp. board<sup>6</sup> connected in the c.i.e. the number of I/O Matrix board 4582 is reduced with one (e.g. 4 exp. boards results in max. 4 I/O Matrix board 4582).

### **EBL512 G3**

Up to 6 I/O Matrix board 4582 on each COM loop can be used, i.e.  $4 \times 6 = 24$  I/O Matrix board 4582.

**NOTE!** For each exp. board connected in the c.i.e. the number of I/O Matrix board 4582 on **COM loop 0** is reduced with one (e.g. 4 exp. boards results in max. 2 I/O Matrix board 4582 on **COM loop 0**).

### **Other limitations**

For I/O Matrix board 4582 programmed as type **Generic** or **Zone** control, the following is valid:

**EBL512:** Max. 4.

**EBL128:** Max. 2.

**EBL512 G3:** Max. 6.

### 4.1 H/W

The I/O Matrix board 4582 is a p.c.b. connected to the Application board either as a piggy back p.c.b. (pin connector) or soldered directly to the board.

The connections to the COM loop and 24 V DC are done via screw connectors located on the Application board respectively. The COM loop and 24 V DC are internally connected to the I/O Matrix board 4582.

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<sup>5</sup> The listed application boards are available on the Australian and New Zealand markets only.

<sup>6</sup> Expansion board = 4580, 4581 and 4583.



## 4.2 **Signal interface**

The I/O Matrix board 4582 is able to individually operate 48 LEDs (outputs) and 16 switches (inputs).

This is done via 14 signals to a 6 x 8 LEDs matrix and 8 signals from a 4 x 4 switches matrix.

What each LED is indicating and what each switch is controlling is programmed via Win512 / Win128 / **WinG3** for the Application board respectively.

## 4.3 **Jumpers**

On the I/O Matrix board 4582 are six jumpers (JP1-6) for board number (address) and type (mode) settings, see chapter "Board number and type settings", page 8.

## 5 Board number and type settings

On the I/O Matrix board 4582 are six jumpers (JP1-6) for board number (address) and type settings.

The board number (address) is used in Win512 / Win128 / WinG3 for the programming of I/O Matrix board 4582.

### 5.1 Board number (address)

I/O matrix board no.	JP1	JP2	JP3
	"1"	"2"	"4"
0			
1	X		
2		X	
3	X	X	
4			X
5	X		X
6		X	X
7	X	X	X

Figure 2. I/O Matrix board 4582, board number (address).  
**NOTE!** Jumper "JP3" is *only used in system EBL 128*.

### 5.2 Type of board

The I/O Matrix board 4582 can be used for different types of Application boards, see chapter "Application boards", page 10.

Jumpers "JP4-6" on the I/O Matrix board 4582 are used for the type settings.

Type (mode)	JP4	JP5	JP6
Application board	"1"	"2"	"4"
Fan control			
Zone control	X		
Generic		X	

Figure 3. I/O Matrix board 4582, type settings. **NOTE!** Jumper "JP6" is for future use.

### 5.3 Jumpers JP1 – JP6

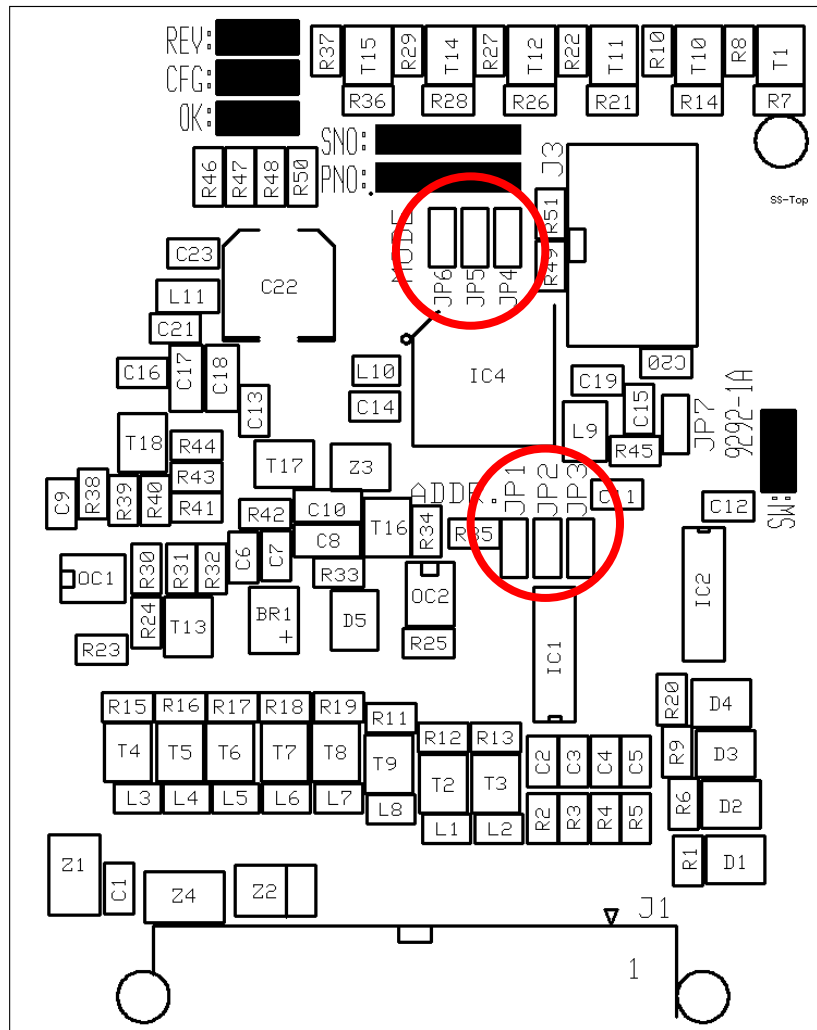


Figure 4. I/O Matrix board 4582 layout. Position of jumpers JP1-JP3 and JP4-JP6 respectively.  
**NOTE!** This figure is for showing the jumper positions only.

**NOTE!**

Jumper JP7 is for production only. Shall **not** be shunted.

## 6 Application boards

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The different types of Application board are briefly described below.

Each Application board require one I/O Matrix board 4582, see chapter "I/O Matrix board", page 6.

### 6.1 Fan control and indication panel board

The **Fan** type of application board<sup>7</sup> can be used for a **Fan control module** with 4 Fan control panels, in order to operate up to 4 different fans.

For each fan, one Multipurpose I/O unit 3361 is required for fan activation and feedback signals.

For each fan, **LEDs** are indicating:

- On
- Auto
- Off
- Running
- Stopped
- Fault

For each fan, **push buttons** are activating:

- On
- Auto
- Off

The fans can be used for the following applications:

- Supply air fan
- Standard fan

### 6.2 Generic control and indication panel board

The **Generic** type of application board<sup>7</sup> can be used for a **Mimic panel** or a **New Zealand indicating panel**.

The 48 outputs can be used for 48 LEDs for indication of e.g. zones. Any programmable output trigger conditions can be used.

The 16 inputs can be used for 16 switches (push buttons, key switches etc.). Any programmable input trigger conditions can be used.

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<sup>7</sup> Available on the Australian and New Zealand markets only.

## 6.3 Zone control and indication panel board

The **Zone** type of application board<sup>7</sup> can be used for a **Zone control and indicating panel**.

The 48 outputs can be used for 16 zones, i.e. three LEDs per zone indicating **Alarm**, **Fault** and **Disabled**.

The 16 inputs can be used for 16 zones, i.e. one switch (push buttons etc.) per zone in order to **Disable** the zone.

## 6.4 Other application boards

It is possible for any manufacturer to make "his own" application board, i.e. to use the 16 programmable switch inputs and the 48 programmable LED outputs for an application. Chapter "7 Connections" shows how the switch inputs, LED outputs, 24 V DC and the COM loop shall be connected to the I/O Matrix board 4582.

### 6.4.1 Type of board

Since the **Fan** and **Zone** types of application board require special equipment and have some pre-defined not programmable functions, the **Generic** type of application board shall be used. The inputs and outputs on this board can be individually programmed.

## 7 Connections

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The connection diagram on the following page shows the connector "J1" and the signals between the I/O Matrix board 4582 and any Application board, i.e. how the 48 (0-47) LED outputs and the 16 (0-15) switch inputs on any control and indicating panel shall be connected to the I/O Matrix board 4582.

The connection diagram also shows the screw connectors, on any Application board, for the COM loop and 24 V DC power supply.

**NOTE!** The connection diagram shows the connection principles. It does not show any EMC protection etc. that might be needed.

### Connector J1:

1. /Key row 0
2. /Key row 1
3. /Key row 2
4. /Key row 3
5. Key in 0
6. Key in 1
7. Key in 2
8. Key in 3
9. LD row 0+
10. LD row 1+
11. LD row 2+
12. LD row 3+
13. LD row 4+
14. LD row 5+
15. LD row 6+
16. LD row 7+
17. LD 0-
18. LD 1-
19. LD 2-
20. LD 3-
21. LD 4-
22. LD 5-
23. 0 V
24. +24 V
25. SB (C)
26. SA (L)

The connector "J1" is a:  
26 ways Top Entry Socket (female),  
3M type 8526-4500 PL

### **NOTE! NOTE!**

If one or more of the switches are of the latching type, all switches have to have a series diode according to the connection diagram on the following page, else not. Type of diode: Schottky diode, e.g. BAT54 (SMD) or BAT42/43.

Latching switches require an I/O Matrix board 4582 software version  $\geq$  1.0.2.

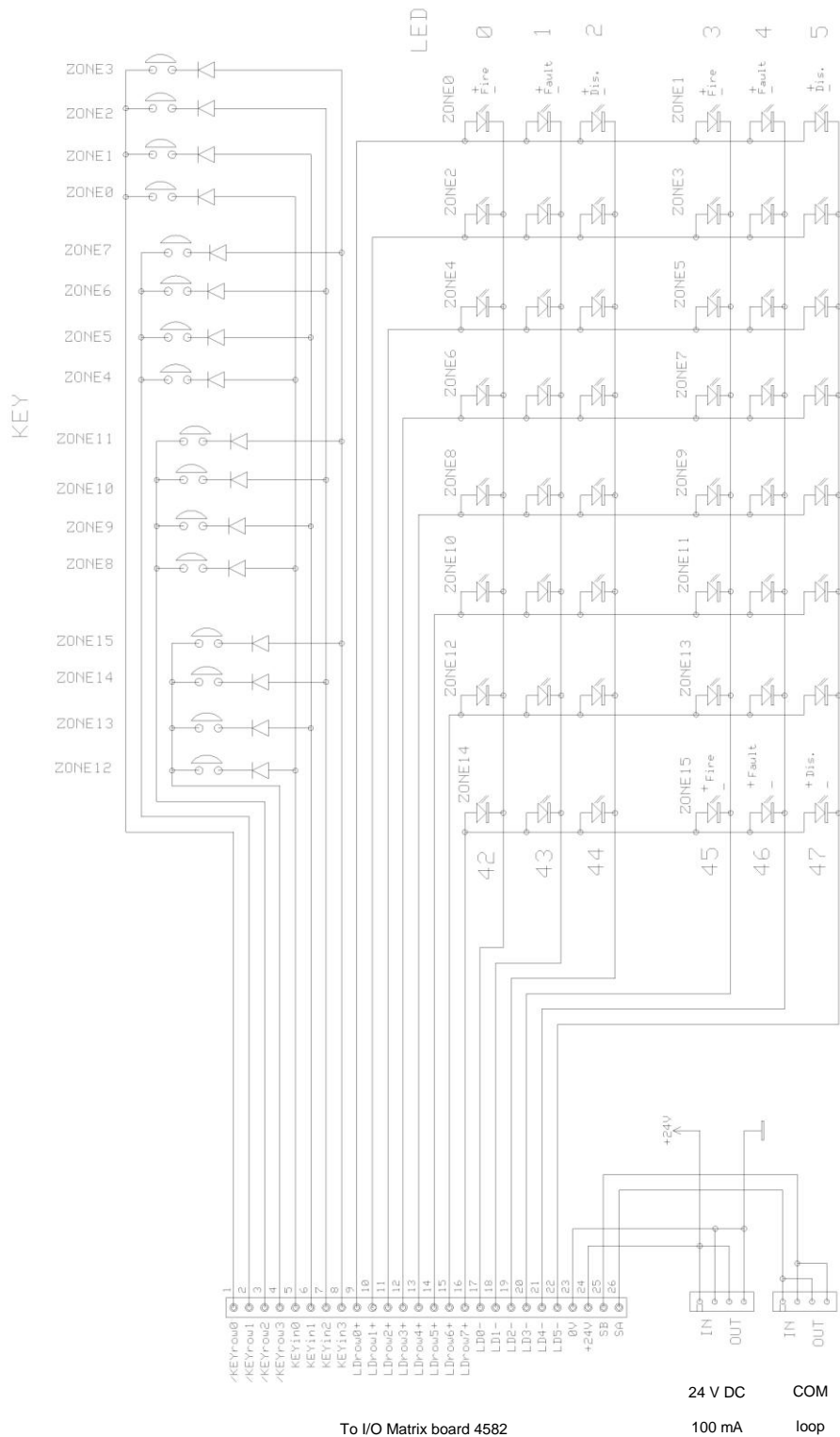


Figure 5. An example showing how the switches and LED:s for a Zone control and indicating panel are connected to the I/O Matrix board.

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## 8 Technical data

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### COM loop voltage

Normal / System: 24 V DC

Allowed voltage: 12-30 V DC.

### COM loop current consumption

Min. / Max.: 4 mA / 6 mA

### Power supply voltage

Normal / System: 24 V DC

Allowed voltage: 18-30 V DC.

### Power supply current consumption

Min. / Max.: 10 mA (4582) / 100 mA (Depending on number of LEDs and activated input switches – application board.)

### LED matrix outputs

Approx. 15 mA (current limitation) per LED.

### Switch matrix inputs

0.1 – 3 mA per switch. (Switches: NO or NC contacts.)

### Ambient temperature (°C)

Operating: -10 to +55

Storage: -55 to +105

### Ambient humidity (%RH)

Max. 90, non condensing

### Ingress protection rating

Not applicable. (Depending on the Application board housing etc.)

### Size L x W x H (mm)

80 x 63 x 17 (the p.c.b. incl. components)

80 x 63 x 27 (the p.c.b. incl. components and header mounted)

### Weight (g)

Approx. 25

### Approvals

-

### NOTE!

All current consumptions are valid by nominal voltage 24 V DC (power supply) and by 25°C.

The rated output voltage for the EBL512 / EBL128 / EBL512 G3 main power source (rectifier) is 24 V ± 1% and for the second power source (the backup battery) 20 – 27 V DC. (The backup battery voltage will, however, decrease to 15 V before the battery is switched off.)



## 9 Revision history

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Revision text is typed with **red font colour** when possible.

### Revision 1

Paragraph:

- 3. Introduction Footnote added. Text revised. Figure text added.
- 7. Connections Text added. Connection diagram revised.

### Revision 2

Information added or revised in the following chapters:

- 1
- 3
- 4 (footnote also added), 4.2
- 5 and 5.1
- 6.1 - 6.3 (footnote also added), 6.4 and 6.4.1 (added)
- 7
- 8

### Revision 3

Information added or revised in the following chapters:

- 3
- 4, 4.2
- 5, 5.1 (Figure 2), 5.2 (Figure 3), 5.3
- 8

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