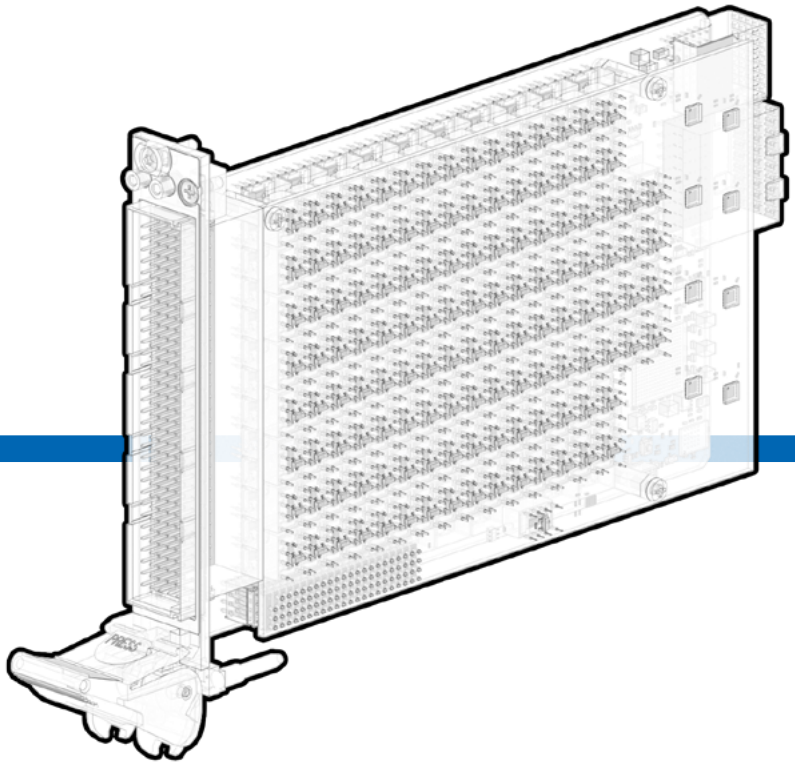
Datasheet



DE140707

PXIe High Density Matrix Module

128x2 2 A 1-Pole

DEICO

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Contents

1. Description

DE140707 PXIe High Density Matrix Module 128x2 2 A 1-Pole is a crosspoint matrix module designed for high-density switching in medium power applications. It features 256 crosspoint matrices with 128x2 and dual 64x2 single-pole configuration, each utilizing an electromechanical relay. Each relay supports switching voltages of up to 220 V DC or 250 V AC and can handle power ratings of up to 60 W (DC) / 62.5 VA (AC). The module has a maximum current capacity of 2 A per channel. The module's current capacity is 2 A. A PXIe chassis is required for operation.

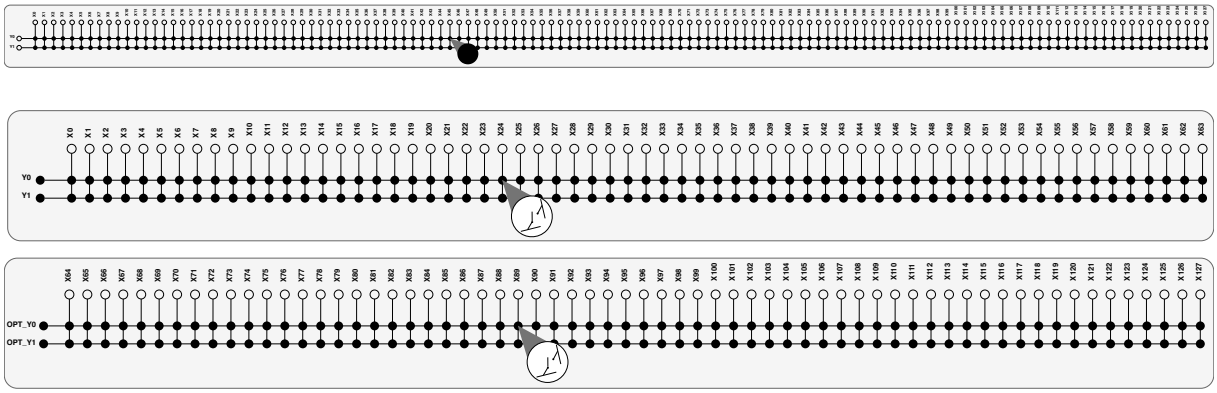
1.1. Key Features

- 256 crosspoints
- 128x2 single pole or 64x2 dual configuration
- Up to 220 V DC / 250 V AC
- Up to 60 W / 62.5 VA
- 2 A rated current
- Hot or cold switching
- Maximum 500 mΩ DC path resistance
- Maximum 5 ms relay operate time

2. Hardware Overview

2.1. Circuitry

The architecture of DE140707 is shown in Figure 1. The DE140707 features 128 connections along the X-axis and 2 connections along the Y-axis. It allows the connection of any X–Y pair, as well as X–X connections, through the Y-axis path. The Y0/Y1 lines implement a selectable topology via an on-board DPDT relay: in the NC (default) position, Y0/Y1 are routed directly to the add-on interface to enable 128x2 operation; in the NO position, Y0/Y1 are routed to the front connector as OPT_Y0/OPT_Y1, enabling dual 64x2 operation. Fail-safe default: in the event of relay de-energization (e.g., power loss), Y0/Y1 automatically revert to the NC path (add-on interface), ensuring the default 128x2 topology.



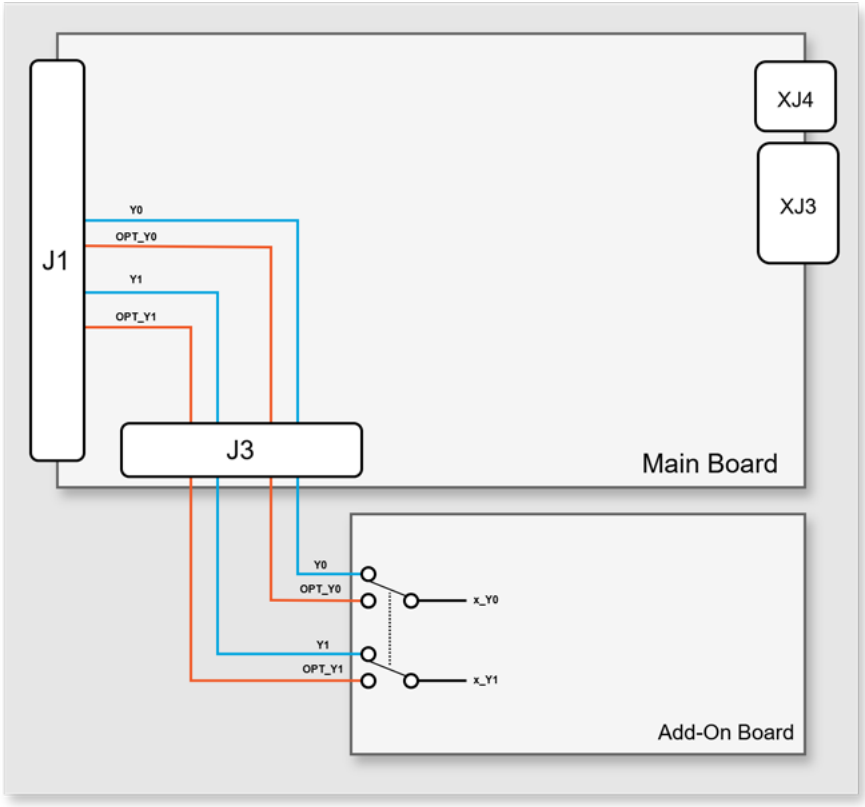


Figure 1: Relay Configuration of DE140707 PXIe High Density Matrix Module 128x2 2 A 1-Pole

2.2. Hardware Specifications

2.2.1. Electrical Specifications

Table 1: Power Supply Requirements

Specification	Min	Typ	Max	Units
Power Supply Current of +12 V (In Full Operation)	–	–	1.85	A
Power Supply Current of +3.3 V (In Full Operation)	–	–	0.8	A

2.2.2. Relay Type

DE140707 is designed with electromechanical relays for reliable switching performance. The module's field maintenance is simplified as it utilizes through-hole relays, ensuring easy replacement and servicing. Relay placement is given in section "Relay Placement". The information on relays is given in Table 2.

Table 2: Information on Relays

Specification	Value
Manufacturer	TE Connectivity
Part Number	IM03TS
Relay Type	Electromechanical, non-latching
Relay Contact Material	Palladium-ruthenium, gold covered

The switching specifications of the relay are given in Table 3.

Table 3: Relay Switching Specifications

Specification	Min	Typ	Max	Units
Switch Voltage	10^{-4}	–	220 250	V DC V AC
Switch Current	10^{-6}	–	2	A
Switch Power	–	–	60 62.5	W VA
Thermal Offset	–	–	10^{-5}	V
DC Path Resistance	–	–	500	mΩ
Operate Time	–	1	5	ms
Bounce Time	–	1	5	ms
Relay Endurance				
At Contact Application (≤ 30 mV / ≤ 10 mA)	$2.5x10^{6}$	–	–	Operations
Resistive, 220 V DC / 0.27 A - 60 W	10^{5}	–	–	Operations
Resistive, 250 V AC / 0.25 A - 62.5 VA	10^{5}	–	–	Operations
Resistive, 30 V DC / 1 A - 30 W	$5x10^{5}$	–	–	Operations

2.2.3. Connector Specifications

The DE140707 module's front connector is a 160-pin male DIN 41612 with part number 384298-E. The Pickering 40-960A-160-F connector and backshell can be used as the mating connector and backshell. This connector and backshell ensure there are no mechanical interference issues. The pinout of the front connector is given in Table 5, in the "Front Connector Pinout" section.

2.2.4. Physical Specifications

DE140707 is compatible with a single 3U PXIe peripheral slot.

2.2.5. Environmental Specifications

The environmental specifications of the module are given in Table 4.

Table 4: Environmental Specifications

Specification	Condition	Value
Operating Humidity	Relative, non-condensing	10% - 90%
Storage Humidity	Relative, non-condensing	5% - 95%
Operating Temperature	Forced-air cooling from chassis	0 °C - +40 °C
Storage Temperature	–	-40 °C – +85 °C

2.2.6. PXIe Compliance

The DE140707 complies with PXIe Hardware Specification 1.1; however, the Local Bus, Trigger Bus, and Star Trigger are not implemented.

3. Signal Connections

3.1. Front Connector Pinout

DE140707 front connector pinout is given in Table 5. The view of front connector is given in Figure 2.

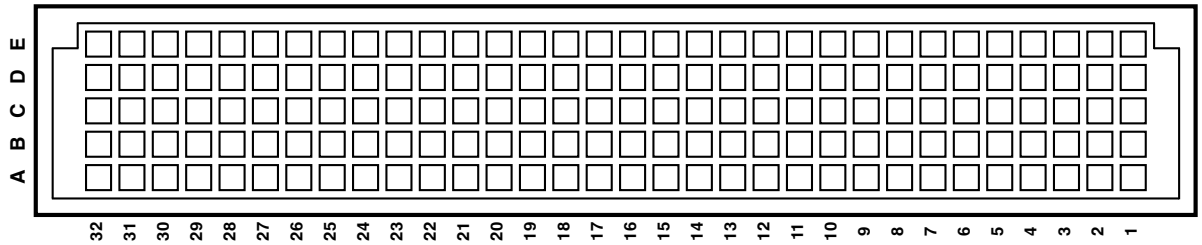


Figure 2: Front Connector

Table 5: Front Connector Pinout

Pin	A	B	C	D	E
1	X0	X1	X2	X3	CHASSIS
2	X4	X5	X6	X7	N.C.
3	X8	X9	X10	X11	N.C.
4	X12	X13	X14	X15	N.C.
5	X16	X17	X18	X19	GND
6	X20	X21	X22	X23	N.C.
7	X24	X25	X26	X27	N.C.
8	X28	X29	X30	X31	N.C.
9	X32	X33	X34	X35	N.C.
10	X36	X37	X38	X39	N.C.
11	X40	X41	X42	X43	N.C.
12	X44	X45	X46	X47	N.C.
13	X48	X49	X50	X51	N.C.
14	X52	X53	X54	X55	N.C.
15	X56	X57	X58	X59	N.C.
16	X60	X61	X62	X63	N.C.
17	X64	X65	X66	X67	N.C.
18	X68	X69	X70	X71	N.C.
19	X72	X73	X74	X75	N.C.
20	X76	X77	X78	X79	N.C.
21	X80	X81	X82	X83	N.C.
22	X84	X85	X86	X87	N.C.
23	X88	X89	X90	X91	N.C.
24	X92	X93	X94	X95	N.C.
25	X96	X97	X98	X99	N.C.
26	X100	X101	X102	X103	N.C.
27	X104	X105	X106	X107	N.C.
28	X108	X109	X110	X111	OPT_Y0
29	X112	X113	X114	X115	OPT_Y1
30	X116	X117	X118	X119	N.C.
31	X120	X121	X122	X123	Y0
32	X124	X125	X126	X127	Y1

3.2. Relay Placement

The DE140707 module consists of two boards: Main board and add-on board. When the relay is replaced, the two boards shall be carefully separated after the four screws on the module are removed. The cross-reference between the main board and the relays is given in Table 6. The relay placement of the main board is given in Figure 3. The cross- reference between the add-on board and the relays is given in Table 7. The relay placement of the add-on board is given in Figure 4.

Table 6: Main Board Cross-Reference of Channels & Relays

Channel	Relay No	Channel	Relay No	Channel	Relay No	Channel	Relay No
Y0X0	K1	**Y0X1**	K2	**Y0X2**	K3	**Y0X3**	K4
Y0X4	K5	**Y0X5**	K6	**Y0X6**	K7	**Y0X7**	K8
Y0X8	K9	**Y0X9**	K10	**Y0X10**	K11	**Y0X11**	K12
Y0X12	K13	**Y0X13**	K14	**Y0X14**	K15	**Y0X15**	K16
Y0X16	K17	**Y0X17**	K18	**Y0X18**	K19	**Y0X19**	K20
Y0X20	K21	**Y0X21**	K22	**Y0X22**	K23	**Y0X23**	K24
Y0X24	K25	**Y0X25**	K26	**Y0X26**	K27	**Y0X27**	K28
Y0X28	K29	**Y0X29**	K30	**Y0X30**	K31	**Y0X31**	K32
Y0X32	K33	**Y0X33**	K34	**Y0X34**	K35	**Y0X35**	K36
Y0X36	K37	**Y0X37**	K38	**Y0X38**	K39	**Y0X39**	K40
Y0X40	K41	**Y0X41**	K42	**Y0X42**	K43	**Y0X43**	K44
Y0X44	K45	**Y0X45**	K46	**Y0X46**	K47	**Y0X47**	K48
Y0X48	K49	**Y0X49**	K50	**Y0X50**	K51	**Y0X51**	K52
Y0X52	K53	**Y0X53**	K54	**Y0X54**	K55	**Y0X55**	K56
Y0X56	K57	**Y0X57**	K58	**Y0X58**	K59	**Y0X59**	K60
Y0X60	K61	**Y0X61**	K62	**Y0X62**	K63	**Y0X63**	K64
Y1X0	K65	**Y1X1**	K66	**Y1X2**	K67	**Y1X3**	K68
Y1X4	K69	**Y1X5**	K70	**Y1X6**	K71	**Y1X7**	K72
Y1X8	K73	**Y1X9**	K74	**Y1X10**	K75	**Y1X11**	K76

Channel	Relay No	Channel	Relay No	Channel	Relay No	Channel	Relay No
Y1X12	K77	**Y1X13**	K78	**Y1X14**	K79	**Y1X15**	K80
Y1X16	K81	**Y1X17**	K82	**Y1X18**	K83	**Y1X19**	K84
Y1X20	K85	**Y1X21**	K86	**Y1X22**	K87	**Y1X23**	K88
Y1X24	K89	**Y1X25**	K90	**Y1X26**	K91	**Y1X27**	K92
Y1X28	K93	**Y1X29**	K94	**Y1X30**	K95	**Y1X31**	K96
Y1X32	K97	**Y1X33**	K98	**Y1X34**	K99	**Y1X35**	K100
Y1X36	K101	**Y1X37**	K102	**Y1X38**	K103	**Y1X39**	K104
Y1X40	K105	**Y1X41**	K106	**Y1X42**	K107	**Y1X43**	K108
Y1X44	K109	**Y1X45**	K110	**Y1X46**	K111	**Y1X47**	K112
Y1X48	K113	**Y1X49**	K114	**Y1X50**	K115	**Y1X51**	K116
Y1X52	K117	**Y1X53**	K118	**Y1X54**	K119	**Y1X55**	K120
Y1X56	K121	**Y1X57**	K122	**Y1X58**	K123	**Y1X59**	K124
Y1X60	K125	**Y1X61**	K126	**Y1X62**	K127	**Y1X63**	K128

Figure 3: Relay Placement of Main Board

Table 7: Add-on Board Cross-Reference of Channels & Relays

Channel	Relay No	Channel	Relay No	Channel	Relay No	Channel	Relay No
Y0X64	K1	**Y0X65**	K2	**Y0X66**	K3	**Y0X67**	K4
Y0X68	K5	**Y0X69**	K6	**Y0X70**	K7	**Y0X71**	K8
Y0X72	K9	**Y0X73**	K10	**Y0X74**	K11	**Y0X75**	K12
Y0X76	K13	**Y0X77**	K14	**Y0X78**	K15	**Y0X79**	K16
Y0X80	K17	**Y0X81**	K18	**Y0X82**	K19	**Y0X83**	K20
Y0X84	K21	**Y0X85**	K22	**Y0X86**	K23	**Y0X87**	K24
Y0X88	K25	**Y0X89**	K26	**Y0X90**	K27	**Y0X91**	K28
Y0X92	K29	**Y0X93**	K30	**Y0X94**	K31	**Y0X95**	K32
Y0X96	K33	**Y0X97**	K34	**Y0X98**	K35	**Y0X99**	K36
Y0X100	K37	**Y0X101**	K38	**Y0X102**	K39	**Y0X103**	K40
Y0X104	K41	**Y0X105**	K42	**Y0X106**	K43	**Y0X107**	K44
Y0X108	K45	**Y0X109**	K46	**Y0X110**	K47	**Y0X111**	K48
Y0X112	K49	**Y0X113**	K50	**Y0X114**	K51	**Y0X115**	K52
Y0X116	K53	**Y0X117**	K54	**Y0X118**	K55	**Y0X119**	K56
Y0X120	K57	**Y0X121**	K58	**Y0X122**	K59	**Y0X123**	K60
Y0X124	K61	**Y0X125**	K62	**Y0X126**	K63	**Y0X127**	K64
Y1X64	K65	**Y1X65**	K66	**Y1X66**	K67	**Y1X67**	K68
Y1X68	K69	**Y1X69**	K70	**Y1X70**	K71	**Y1X71**	K72
Y1X72	K73	**Y1X73**	K74	**Y1X74**	K75	**Y1X75**	K76
Y1X76	K77	**Y1X77**	K78	**Y1X78**	K79	**Y1X79**	K80
Y1X80	K81	**Y1X81**	K82	**Y1X82**	K83	**Y1X83**	K84
Y1X84	K85	**Y1X85**	K86	**Y1X86**	K87	**Y1X87**	K88

Channel	Relay No	Channel	Relay No	Channel	Relay No	Channel	Relay No
Y1X88	K89	**Y1X89**	K90	**Y1X90**	K91	**Y1X91**	K92
Y1X92	K93	**Y1X93**	K94	**Y1X94**	K95	**Y1X95**	K96
Y1X96	K97	**Y1X97**	K98	**Y1X98**	K99	**Y1X99**	K100
Y1X100	K101	**Y1X101**	K102	**Y1X102**	K103	**Y1X103**	K104
Y1X104	K105	**Y1X105**	K106	**Y1X106**	K107	**Y1X107**	K108
Y1X108	K109	**Y1X109**	K110	**Y1X110**	K111	**Y1X111**	K112
Y1X112	K113	**Y1X113**	K114	**Y1X114**	K115	**Y1X115**	K116
Y1X116	K117	**Y1X117**	K118	**Y1X118**	K119	**Y1X119**	K120
Y1X120	K121	**Y1X121**	K122	**Y1X122**	K123	**Y1X123**	K124
Y1X124	K125	**Y1X125**	K126	**Y1X126**	K127	**Y1X127**	K128

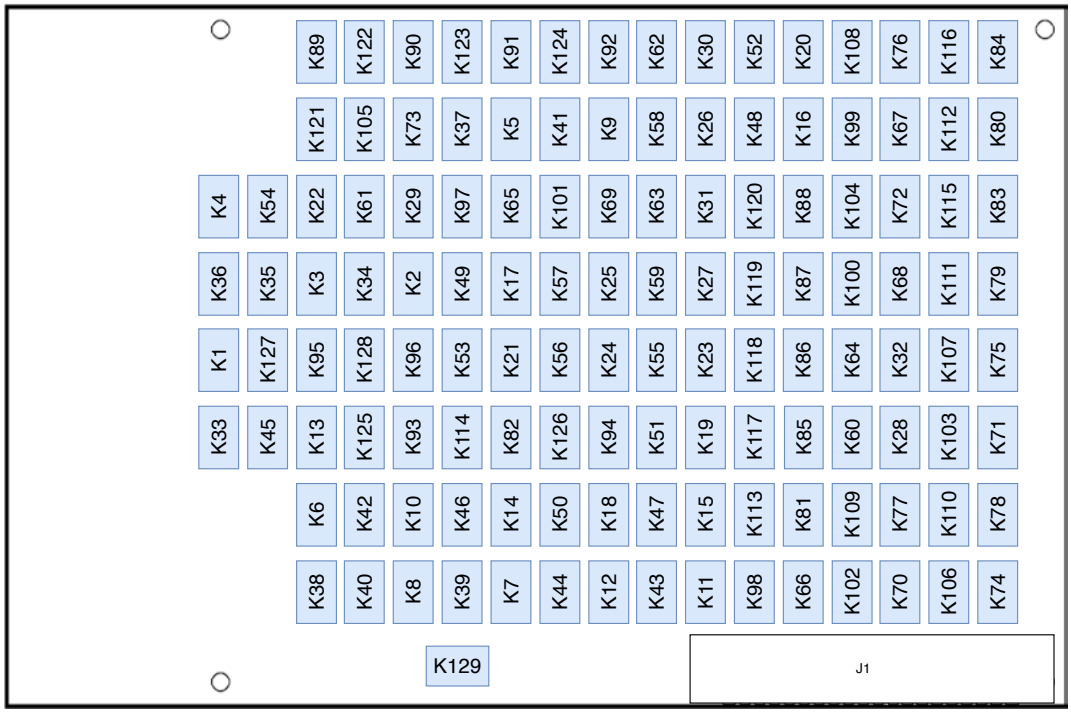


Figure 4: Relay Placement of Add-on Board

4. Safety Guidelines

The DE140707 shall not be operated in any manner not specified in this document. Misuse of the product may result in a hazard. Safety protection features may be compromised if the product is damaged. In the event of damage, the product shall be returned for repair.

5. Compatibility Guidelines

This product has been tested and found to comply with the applicable regulatory requirements and limits for electromagnetic compatibility (EMC). These requirements and limits are intended to provide reasonable protection against harmful interference when the product is operated within the specified electromagnetic environment.

This product is intended for use in industrial locations. However, harmful interference may occur in certain installations if the product is connected to peripheral devices or test objects, or if it is used in residential or commercial areas. To minimize interference with radio and television reception and to prevent unacceptable performance degradation, the product shall be installed and operated in strict accordance with the instructions specified in the product documentation.

Any changes or modifications to the product not expressly approved by DEICO may void the user's authority to operate the equipment under local regulatory rules.

To ensure the specified EMC performance, the product shall be operated only with shielded cables and accessories.

To ensure the specified EMC performance, the length of any cable attached to the front connectors shall not exceed 3 m (10 ft.).