DE140701

PXIe High Density Matrix Module

32x4 2 A 1-Pole

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Contents

1. Description

DE140701 PXIe High Density Matrix Module 32x4 2 A 1-Pole is a crosspoint matrix module designed for high-density switching in medium power applications. It features 128 crosspoint matrices with 32x4 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

- 128 crosspoint
- 32x4 single pole 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 DE140701 is shown in Figure 1. The DE140701 features 32 connections along the X-axis and 4 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.
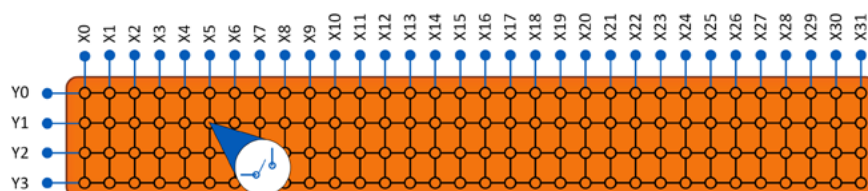

Figure 1: DE140701 Relay Configuration

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2.2. Electrical

The power supply requirements of the DE140701 module are given in Table 1.

Table 1: Power Supply Requirements

Specification	Min	Typical	Max	Units
Power Supply Current of +12 V (In Full Operation)	–	–	1.15	A
Power Supply Current of +3.3 V (In Full Operation)	–	–	0.5	A

2.3. Relay Type

DE140701 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, latching
Relay Contact Material	Palladium-ruthenium, gold covered

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

Table 3: Relay Switching Specification

Specification	Min	Typical	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)	2.5×10^{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	5×10^{5}	–	–	Operations

2.4. Connectors

The DE140701 module's front connector is a 78-position male D-SUB with part number 181-M78-113R001. A standard D-SUB78 connector and backshell can be used for mating. 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.

2.5. Physical

DE140701 is compatible with a single 3U PXIe Peripheral Slot.

2.6. Environmental

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

Table 4: Environmental Specifications

Parameter	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

2.7. PXIe Compliance

The DE140701 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

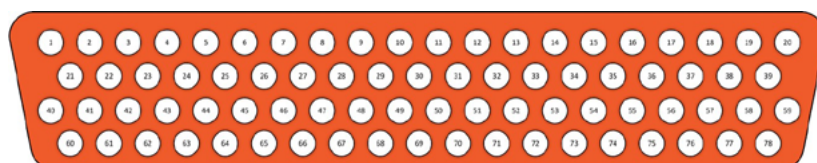DE140701 front connector pinout is given in Table 5. The view of front connector is given in Figure 2.

Figure 2: Front Connector

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	X0	21	X1	40	X2	60	X3
2	X4	22	X5	41	X6	61	X7
3	X8	23	X9	42	X10	62	X11
4	X12	24	X13	43	X14	63	X15
5	X16	25	X17	44	X18	64	X19
6	X20	26	X21	45	X22	65	X23
7	X24	27	X25	46	X26	66	X27
8	X28	28	X29	47	X30	67	X31
9	NC	29	NC	48	NC	68	NC
10	NC	30	NC	49	NC	69	NC
11	NC	31	NC	50	NC	70	NC
12	NC	32	NC	51	NC	71	NC
13	NC	33	NC	52	NC	72	NC
14	NC	34	NC	53	NC	73	NC
15	NC	35	NC	54	NC	74	NC
16	NC	36	NC	55	NC	75	NC
17	NC	37	NC	56	NC	76	NC
18	Y0	38	Y1	57	Y2	77	Y3
19	NC	39	NC	58	NC	78	CHASSIS
20	NC	–	–	59	NC	–	–

3.2. Relay Placement

The cross-reference between the module and the relays is given in Table 6. The relay placement of the module is given in Figure 3.

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

Channel	Relay No	Channel	Relay No	Channel	Relay No	Channel	Relay No
X0Y0	K1	X0Y1	K2	X0Y2	K3	X0Y3	K4
X1Y0	K5	X1Y1	K6	X1Y2	K7	X1Y3	K8
X2Y0	K9	X2Y1	K10	X2Y2	K11	X2Y3	K12
X3Y0	K13	X3Y1	K14	X3Y2	K15	X3Y3	K16
X4Y0	K17	X4Y1	K18	X4Y2	K19	X4Y3	K20
X5Y0	K21	X5Y1	K22	X5Y2	K23	X5Y3	K24
X6Y0	K25	X6Y1	K26	X6Y2	K27	X6Y3	K28
X7Y0	K29	X7Y1	K30	X7Y2	K31	X7Y3	K32
X8Y0	K33	X8Y1	K34	X8Y2	K35	X8Y3	K36
X9Y0	K37	X9Y1	K38	X9Y2	K39	X9Y3	K40
X10Y0	K41	X10Y1	K42	X10Y2	K43	X10Y3	K44
X11Y0	K45	X11Y1	K46	X11Y2	K47	X11Y3	K48
X12Y0	K49	X12Y1	K50	X12Y2	K51	X12Y3	K52
X13Y0	K53	X13Y1	K54	X13Y2	K55	X13Y3	K56
X14Y0	K57	X14Y1	K58	X14Y2	K59	X14Y3	K60
X15Y0	K61	X15Y1	K62	X15Y2	K63	X15Y3	K64
X16Y0	K65	X16Y1	K66	X16Y2	K67	X16Y3	K68
X17Y0	K69	X17Y1	K70	X17Y2	K71	X17Y3	K72
X18Y0	K73	X18Y1	K74	X18Y2	K75	X18Y3	K76
X19Y0	K77	X19Y1	K78	X19Y2	K79	X19Y3	K80
X20Y0	K81	X20Y1	K82	X20Y2	K83	X20Y3	K84
X21Y0	K85	X21Y1	K86	X21Y2	K87	X21Y3	K88
X22Y0	K89	X22Y1	K90	X22Y2	K91	X22Y3	K92
X23Y0	K93	X23Y1	K94	X23Y2	K95	X23Y3	K96
X24Y0	K97	X24Y1	K98	X24Y2	K99	X24Y3	K100
X25Y0	K101	X25Y1	K102	X25Y2	K103	X25Y3	K104
X26Y0	K105	X26Y1	K106	X26Y2	K107	X26Y3	K108
X27Y0	K109	X27Y1	K110	X27Y2	K111	X27Y3	K112
X28Y0	K113	X28Y1	K114	X28Y2	K115	X28Y3	K116
X29Y0	K117	X29Y1	K118	X29Y2	K119	X29Y3	K120
X30Y0	K121	X30Y1	K122	X30Y2	K123	X30Y3	K124
X31Y0	K125	X31Y1	K126	X31Y2	K127	X31Y3	K128

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Figure 3: Relay Placement of Module

4. Safety Guidelines

⚠️ **Caution**   ESD can damage electronic components without adequate protection and may cause permanent damage to the device.

⚠️ **Caution**   Hot-plug is not supported by the DE140701; therefore, the device must not be inserted or removed when the chassis power is on.

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