ETX-16201/ 16202/16203/ 16209 Specifications

Contents

ETX-16201/16202/16203/16209 Specifications

These specifications apply to the ETX-16201/16202/16203/16209.

Revision History

Version	Date changed	Description
378997B-01	December 2024	Added information for the J1 pinout.
378997A-01	September 2024	Initial release.

Looking For Something Else?

For information not found in the specifications for your product, such as operating instructions, browse **Related Information**.

Related information:

- [ETX-16201/16202/16203/16209 User Manual](#)
- [Software and Driver Downloads](#)
- [Dimensional Drawings](#)
- [Product Certifications](#)
- [Letter of Volatility](#)
- [Discussion Forums](#)
- [NI Learning Center](#)

Definitions

Warranted specifications describe the performance of a model under stated operating conditions and are covered by the model warranty. Warranted specifications account for measurement uncertainties, temperature drift, and aging. Warranted specifications are ensured by design or verified during production and calibration.

Characteristics describe values that are relevant to the use of the model under stated operating conditions but are not covered by the model warranty.

- ***Typical*** specifications describe the performance met by a majority of models.
- ***Typical-95*** specifications describe the performance met by 95% (≈2σ) of models with a 95% confidence.
- ***Nominal*** specifications describe an attribute that is based on design, conformance testing, or supplemental testing.
- ***Measured*** specifications describe the measured performance of a representative model.

Specifications are ***Typical*** unless otherwise noted.

Conditions

Refer to `ni.com/docs` for detailed specifications on the specific instruments used within the ETX-16201/16202/16203/16209.

> **Note** Other product and company names listed are trademarks or trade names of their respective companies.

These specifications apply to all ETX-16201/16202/16203/16209 configuration options unless otherwise noted. Specifications are valid for the system and all included instruments under the following conditions unless otherwise noted.

- ETX Inverter Production Test System environmental characteristics are met
- Instrument-level conditions are met

Calibration Conditions

The performance of an externally calibrated instrument is defined in the instrument specifications. Additionally, specifications for externally calibrated instruments are only valid if the conditions defined in the instrument specifications are met.

Mass Interconnect Pinouts

The ETX-1620x has a mass interconnect component with the following measurement category, isolation voltages, and pinouts. Mass interconnect information is located in the ***ETX-16201/16202/16203/16209 User Manual*** and ***ETX-16201/16202/16203/16209 Specifications***.

Measurement Category

> ⚠️ **Caution** Do not connect the product to signals or use for measurements within Measurement Categories II, III, or IV.

> ⚠️ **Attention** Ne pas connecter le produit à des signaux dans les catégories de mesure II, III ou IV et ne pas l'utiliser pour effectuer des mesures dans ces catégories.

> ⚡ **Warning** Do not connect the product to signals or use for measurements within Measurement Categories II, III, or IV, or for measurements on MAINs circuits or on circuits derived from Overvoltage Category II, III, or IV which may have transient overvoltages above what the product can withstand. The product must not be connected to circuits that have a maximum voltage above the continuous working voltage, relative to earth or to other channels, or this could damage and defeat the insulation. The product can only withstand transients up to the transient overvoltage rating without breakdown or damage to the insulation. An analysis of the working voltages, loop impedances, temporary overvoltages, and transient overvoltages in the system must be conducted prior to making measurements.

> ⚡ **Mise en garde** Ne pas connecter le produit à des signaux dans les catégories de mesure II, III ou IV et ne pas l'utiliser pour des mesures dans ces catégories, ou des mesures sur secteur ou sur des circuits dérivés de surtensions de catégorie II, III ou IV pouvant présenter des surtensions transitoires supérieures à ce que le produit peut supporter. Le produit ne doit pas être raccordé à des circuits ayant une tension maximale supérieure à la tension de fonctionnement continu, par rapport à la terre ou à d'autres voies,

sous peine d'endommager et de compromettre l'isolation. Le produit peut tomber en panne et son isolation risque d'être endommagée si les tensions transitoires dépassent la surtension transitoire nominale. Une analyse des tensions de fonctionnement, des impédances de boucle, des surtensions temporaires et des surtensions transitoires dans le système doit être effectuée avant de procéder à des mesures.

Measurement Category I is for measurements performed on circuits not directly connected to the electrical distribution system referred to as *MAINS* voltage. MAINS is a hazardous live electrical supply system that powers equipment. This category is for measurements of voltages from specially protected secondary circuits. Such voltage measurements include signal levels, special equipment, limited-energy parts of equipment, circuits powered by regulated low-voltage sources, and electronics.

Note Measurement Categories CAT I and CAT O are equivalent. These test and measurement circuits are for other circuits not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV.

Isolation Voltages

Isolation voltages only apply to hazardous voltage pins on the mass interconnect connectors referenced in the following table. Connectors not referenced in the following table have no isolation voltage ratings and are not intended to handle voltages above 30 Vrms, 60 VDC, or 42.4 Vpk.

- **Working Voltage**—The highest RMS value of the AC or DC voltage across the insulation that can continuously occur when the equipment is supplied at rated voltage.
- **Transient Overvoltage (Vpk)**—An overvoltage condition of a relatively short duration, a few milliseconds or less, oscillatory or non-oscillatory, usually highly damped.

Table 1. Isolation Voltages on Mass Interconnect Connectors

Connector	Isolation Barrier	Maximum Working Voltage	Transient Overvoltage
J9	Channel-to-ground/ earth (Common Mode)	1500 VDC	0 Vpk
J11	Channel-to-ground/ earth (Common Mode)	230 VDC	0 Vpk
J12	Channel-to-ground/ earth (Common Mode)	230 VDC	0 Vpk
J13	Channel-to-ground/ earth (Common Mode)	300 VDC	0 Vpk
J15	Channel-to-ground/ earth (Common Mode)	1500 VDC	0 Vpk

J1 Pinout: Adapter Control and Communication

Figure 1. J1 Pinout

> **Note** EMO PASSTHRU pins are only available when you use the EMO passthrough accessory (part number 756303-01).

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A1	COM2 RXD	B1	COM2 DTR	C1	COM3 DTR	D1	COM3 RXD
A2	COM2 RI	B2	COM2 DSR	C2	COM3 DSR	D2	COM3 RI
A3	COM2 DCD	B3	COM2 RTS	C3	COM3 RTS	D3	COM3 DCD
A4	COM2 TXD	B4	COM2 CTS	C4	COM3 CTS	D4	COM3 TXD
A5	RESERVED	B5	COM2 GND	C5	COM3 GND	D5	RESERVED
A6	DIO1 P0.0+	B6	DIO1 P1.0+	C6	DIO1 P4.0+	D6	DIO1 P5.0+
A7	DIO1 P0.0-	B7	DIO1 P1.0-	C7	DIO1 P4.0-	D7	DIO1 P5.0-
A8	DIO1 P0.1+	B8	DIO1 P1.1+	C8	DIO1 P4.1+	D8	DIO1 P5.1+
A9	DIO1 P0.1-	B9	DIO1 P1.1-	C9	DIO1 P4.1-	D9	DIO1 P5.1-
A10	DIO1 P0.2+	B10	DIO1 P1.2+	C10	DIO1 P4.2+	D10	DIO1 P5.2+
A11	DIO1 P0.2-	B11	DIO1 P1.2-	C11	DIO1 P4.2-	D11	DIO1 P5.2-
A12	DIO1 P0.3+	B12	DIO1 P1.3+	C12	DIO1 P4.3+	D12	DIO1 P5.3+
A13	DIO1 P0.3-	B13	DIO1 P1.3-	C13	DIO1 P4.3-	D13	DIO1 P5.3-
A14	DIO1 P0.4+	B14	DIO1 P1.4+	C14	DIO1 P4.4+	D14	DIO1 P5.4+
A15	DIO1 P0.4-	B15	DIO1 P1.4-	C15	DIO1 P4.4-	D15	DIO1 P5.4-
A16	DIO1 P0.5+	B16	DIO1 P1.5+	C16	DIO1 P4.5+	D16	DIO1 P5.5+
A17	DIO1 P0.5-	B17	DIO1 P1.5-	C17	DIO1 P4.5-	D17	DIO1 P5.5-
A18	DIO1 P0.6+	B18	DIO1 P1.6+	C18	DIO1 P4.6+	D18	DIO1 P5.6+
A19	DIO1 P0.6-	B19	DIO1 P1.6-	C19	DIO1 P4.6-	D19	DIO1 P5.6-
A20	DIO1 P0.7+	B20	DIO1 P1.7+	C20	DIO1 P4.7+	D20	DIO1 P5.7+
A21	DIO1 P0.7-	B21	DIO1 P1.7-	C21	DIO1 P4.7-	D21	DIO1 P5.7-
A22	RELAY_DRIVER1 CH0	B22	RELAY_DRIVER1 CH4	C22	RELAY_DRIVER1 CH8	D22	RELAY_DRIVER1 CH12
A23	RELAY_DRIVER1 CH1	B23	RELAY_DRIVER1 CH5	C23	RELAY_DRIVER1 CH9	D23	RELAY_DRIVER1 CH13
A24	RELAY_DRIVER1 CH2	B24	RELAY_DRIVER1 CH6	C24	RELAY_DRIVER1 CH10	D24	RELAY_DRIVER1 CH14
A25	RELAY_DRIVER1 CH3	B25	RELAY_DRIVER1 CH7	C25	RELAY_DRIVER1 CH11	D25	RELAY_DRIVER1 CH15
A26	RELAY_DRIVER1 GND CH0:7	B26	SHIELD	C26	RELAY_DRIVER1 GND CH8:15	D26	RELAY_DRIVER1 DGND
A27	RELAY_DRIVER1 TRIG OUT	B27	RELAY_DRIVER1 TRIG IN	C27	RELAY_DRIVER1 +5V	D27	RELAY_DRIVER1 +12V
A28	RESERVED	B28	NET1 SHIELD	C28	RESERVED	D28	NET2 SHIELD
A29	NET1 RX+	B29	NET1 TX+	C29	NET2 RX+	D29	NET2 TX+
A30	NET1 RX-	B30	NET1 TX-	C30	NET2 RX-	D30	NET2 TX-
A31	EMO PASSTHRU L1	B31	EMO PASSTHRU L2	C31	EMO PASSTHRU R1	D31	EMO PASSTHRU R2
A32	ISO K1 11	B32	ISO K2 12	C32		D32	ISO K2 22
A33	ADAPTER DETECT	B33	EMO MEASURE+	C33	HV ENABLE	D33	ISO K1 14 (USER)
A34	ADAPTER DETECT GND	B34	EMO MEASURE-	C34	HV ENABLE GND	D34	ISO K2 24 (USER_RET)
A35	RESERVED	B35	RESERVED	C35	RESERVED	D35	RESERVED
A36	RESERVED	B36	RESERVED	C36	RESERVED	D36	RESERVED
A37	RESERVED	B37	RESERVED	C37	RESERVED	D37	RESERVED
A38	RESERVED	B38	RESERVED	C38	RESERVED	D38	RESERVED
A39	RESERVED	B39	RESERVED	C39	RESERVED	D39	RESERVED
A40	RESERVED	B40	RESERVED	C40	RESERVED	D40	RESERVED
A41	RESERVED	B41	RESERVED	C41	RESERVED	D41	RESERVED
A42	RESERVED	B42	RESERVED	C42	RESERVED	D42	RESERVED
A43	RESERVED	B43	RESERVED	C43	RESERVED	D43	RESERVED
A44	RESERVED	B44	RESERVED	C44	RESERVED	D44	RESERVED
A45	RESERVED	B45	RESERVED	C45	RESERVED	D45	RESERVED
A46	RESERVED	B46	RESERVED	C46	RESERVED	D46	RESERVED
A47	RESERVED	B47	RESERVED	C47	RESERVED	D47	RESERVED
A48	RESERVED	B48	RESERVED	C48	RESERVED	D48	RESERVED

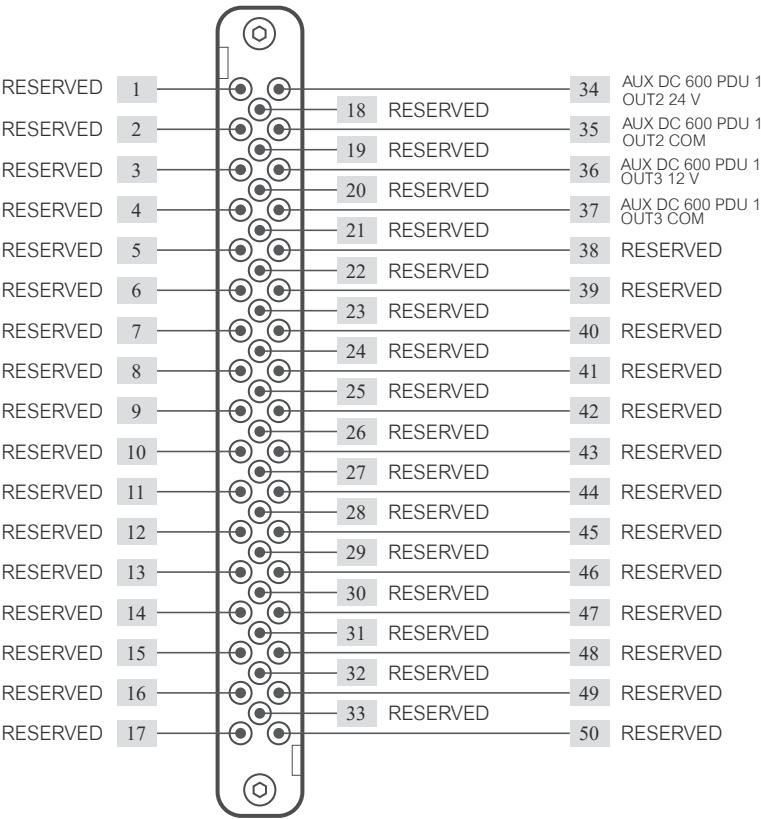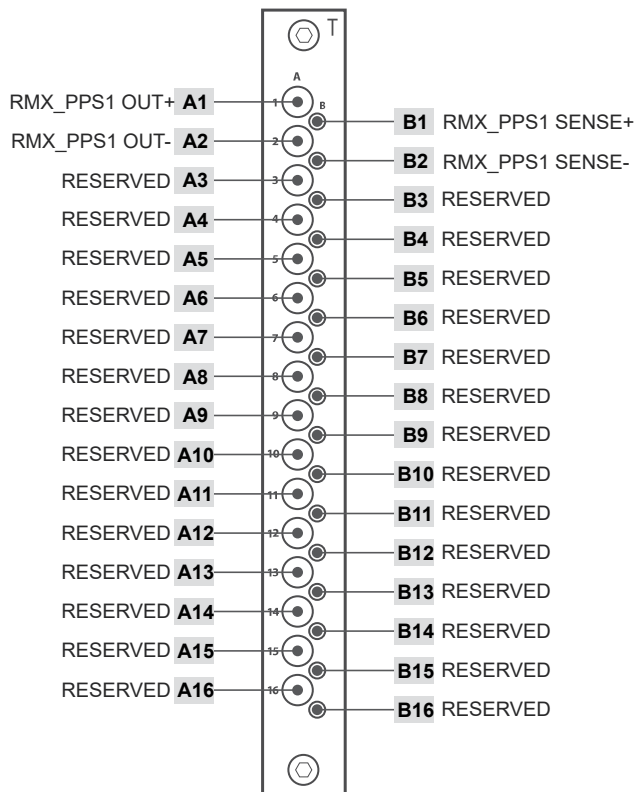Note: A32 ISO K1 11, B32 ISO K2 12, C32 ISO K2 21, D32 ISO K2 22

Refer to **Additional Components** for more information about the component type associated with J1.

Related reference:

- Additional Components

J2 Pinout: DC PDU 1

Figure 2. J2 Pinout

Pin	Signal		Pin	Signal		Pin	Signal
1	RESERVED		18	RESERVED		34	AUX DC 600 PDU 1 OUT2 24 V
2	RESERVED		19	RESERVED		35	AUX DC 600 PDU 1 OUT2 COM
3	RESERVED		20	RESERVED		36	AUX DC 600 PDU 1 OUT3 12 V
4	RESERVED		21	RESERVED		37	AUX DC 600 PDU 1 OUT3 COM
5	RESERVED		22	RESERVED		38	RESERVED
6	RESERVED		23	RESERVED		39	RESERVED
7	RESERVED		24	RESERVED		40	RESERVED
8	RESERVED		25	RESERVED		41	RESERVED
9	RESERVED		26	RESERVED		42	RESERVED
10	RESERVED		27	RESERVED		43	RESERVED
11	RESERVED		28	RESERVED		44	RESERVED
12	RESERVED		29	RESERVED		45	RESERVED
13	RESERVED		30	RESERVED		46	RESERVED
14	RESERVED		31	RESERVED		47	RESERVED
15	RESERVED		32	RESERVED		48	RESERVED
16	RESERVED		33	RESERVED		49	RESERVED
17	RESERVED					50	RESERVED

J4 Pinout: DMM1, MATRIX1, and SMU1

Figure 3. J4 Pinout

Pin	A	Pin	B	Pin	C	Pin	D
A1	DMM1 HI	B1	RESERVED	C1	DMM1 HI SENSE	D1	RESERVED
A2	RESERVED	B2	RESERVED	C2	RESERVED	D2	RESERVED
A3	RESERVED	B3	DMM1 LO	C3	RESERVED	D3	DMM1 LO SENSE
A4	RESERVED	B4	RESERVED	C4	RESERVED	D4	RESERVED
A5	MATRIX1 C0+	B5	MATRIX1 C2+	C5	MATRIX1 C4+	D5	MATRIX1 C6+
A6	MATRIX1 C0-	B6	MATRIX1 C2-	C6	MATRIX1 C4-	D6	MATRIX1 C6-
A7	MATRIX1 C1+	B7	MATRIX1 C3+	C7	MATRIX1 C5+	D7	MATRIX1 C7+
A8	MATRIX1 C1-	B8	MATRIX1 C3-	C8	MATRIX1 C5-	D8	MATRIX1 C7-
A9	MATRIX1 R0+	B9	MATRIX1 R0-	C9	MATRIX1 R1+	D9	MATRIX1 R1-
A10	MATRIX1 C8+	B10	MATRIX1 C10+	C10	MATRIX1 C12+	D10	MATRIX1 C14+
A11	MATRIX1 C8-	B11	MATRIX1 C10-	C11	MATRIX1 C12-	D11	MATRIX1 C14-
A12	MATRIX1 C9+	B12	MATRIX1 C11+	C12	MATRIX1 C13+	D12	MATRIX1 C15+
A13	MATRIX1 C9-	B13	MATRIX1 C11-	C13	MATRIX1 C13-	D13	MATRIX1 C15-
A14	MATRIX1 R2+	B14	MATRIX1 R2-	C14	MATRIX1 R3+	D14	MATRIX1 R3-
A15	MATRIX1 C16+	B15	MATRIX1 C18+	C15	MATRIX1 C20+	D15	MATRIX1 C22+
A16	MATRIX1 C16-	B16	MATRIX1 C18-	C16	MATRIX1 C20-	D16	MATRIX1 C22-
A17	MATRIX1 C17+	B17	MATRIX1 C19+	C17	MATRIX1 C21+	D17	MATRIX1 C23+
A18	MATRIX1 C17-	B18	MATRIX1 C19-	C18	MATRIX1 C21-	D18	MATRIX1 C23-
A19	MATRIX1 R4+	B19	MATRIX1 R4-	C19	MATRIX1 R5+	D19	MATRIX1 R5-
A20	MATRIX1 C24+	B20	MATRIX1 C26+	C20	MATRIX1 C28+	D20	MATRIX1 C30+
A21	MATRIX1 C24-	B21	MATRIX1 C26-	C21	MATRIX1 C28-	D21	MATRIX1 C30-
A22	MATRIX1 C25+	B22	MATRIX1 C27+	C22	MATRIX1 C29+	D22	MATRIX1 C31+
A23	MATRIX1 C25-	B23	MATRIX1 C27-	C23	MATRIX1 C29-	D23	MATRIX1 C31-
A24	MATRIX1 R6+	B24	MATRIX1 R6-	C24	MATRIX1 R7+	D24	MATRIX1 R7-
A25	MATRIX1 C32+	B25	MATRIX1 C34+	C25	MATRIX1 C36+	D25	MATRIX1 C38+
A26	MATRIX1 C32-	B26	MATRIX1 C34-	C26	MATRIX1 C36-	D26	MATRIX1 C38-
A27	MATRIX1 C33+	B27	MATRIX1 C35+	C27	MATRIX1 C37+	D27	MATRIX1 C39+
A28	MATRIX1 C33-	B28	MATRIX1 C35-	C28	MATRIX1 C37-	D28	MATRIX1 C39-
A29	MATRIX1 R8+	B29	MATRIX1 R8-	C29	MATRIX1 R9+	D29	MATRIX1 R9-
A30	MATRIX1 C40+	B30	MATRIX1 C42+	C30	MATRIX1 C44+	D30	MATRIX1 C46+
A31	MATRIX1 C40-	B31	MATRIX1 C42-	C31	MATRIX1 C44-	D31	MATRIX1 C46-
A32	MATRIX1 C41+	B32	MATRIX1 C43+	C32	MATRIX1 C45+	D32	MATRIX1 C47+
A33	MATRIX1 C41-	B33	MATRIX1 C43-	C33	MATRIX1 C45-	D33	MATRIX1 C47-
A34	MATRIX1 R10+	B34	MATRIX1 R10-	C34	MATRIX1 R11+	D34	MATRIX1 R11-
A35	MATRIX1 C48+	B35	MATRIX1 C50+	C35	MATRIX1 C52+	D35	MATRIX1 C54+
A36	MATRIX1 C48-	B36	MATRIX1 C50-	C36	MATRIX1 C52-	D36	MATRIX1 C54-
A37	MATRIX1 C49+	B37	MATRIX1 C51+	C37	MATRIX1 C53+	D37	MATRIX1 C55+
A38	MATRIX1 C49-	B38	MATRIX1 C51-	C38	MATRIX1 C53-	D38	MATRIX1 C55-
A39	MATRIX1 R12+	B39	MATRIX1 R12-	C39	MATRIX1 R13+	D39	MATRIX1 R13-
A40	MATRIX1 C56+	B40	MATRIX1 C58+	C40	MATRIX1 C60+	D40	MATRIX1 C62+
A41	MATRIX1 C56-	B41	MATRIX1 C58-	C41	MATRIX1 C60-	D41	MATRIX1 C62-
A42	MATRIX1 C57+	B42	MATRIX1 C59+	C42	MATRIX1 C61+	D42	MATRIX1 C63+
A43	MATRIX1 C57-	B43	MATRIX1 C59-	C43	MATRIX1 C61-	D43	MATRIX1 C63-
A44	MATRIX1 R14+	B44	MATRIX1 R14-	C44	MATRIX1 R15+	D44	MATRIX1 R15-
A45	GUARD	B45	RESERVED	C45	RESERVED	D45	RESERVED
A46	SMU1 HI	B46	SMU1 GUARD	C46	SMU1 LO	D46	SMU1 CHS GND
A47	SMU1 GUARD	B47	SMU1 GUARD	C47	SMU1 LO SENSE	D47	RESERVED
A48	SMU1 HI SENSE	B48	RESERVED	C48	RESERVED	D48	RESERVED

Refer to **Additional Components** for more information about the component type associated with J4.

Related reference:

- Additional Components
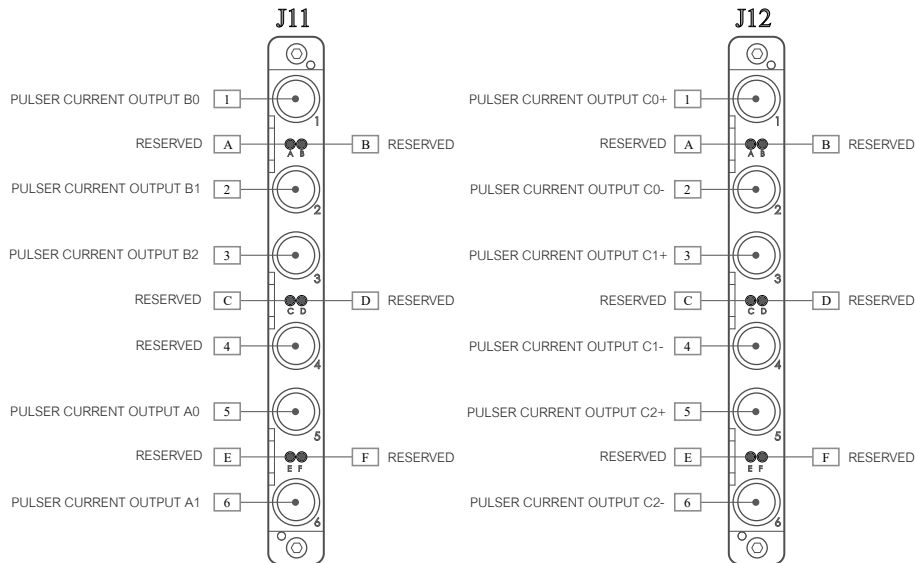
J6: RMX_PPS1

Figure 4. J6 Pinout

RMX_PPS1 OUT+ **A1**	**B1** RMX_PPS1 SENSE+
RMX_PPS1 OUT- **A2**	**B2** RMX_PPS1 SENSE-
RESERVED **A3**	**B3** RESERVED
RESERVED **A4**	**B4** RESERVED
RESERVED **A5**	**B5** RESERVED
RESERVED **A6**	**B6** RESERVED
RESERVED **A7**	**B7** RESERVED
RESERVED **A8**	**B8** RESERVED
RESERVED **A9**	**B9** RESERVED
RESERVED **A10**	**B10** RESERVED
RESERVED **A11**	**B11** RESERVED
RESERVED **A12**	**B12** RESERVED
RESERVED **A13**	**B13** RESERVED
RESERVED **A14**	**B14** RESERVED
RESERVED **A15**	**B15** RESERVED
RESERVED **A16**	**B16** RESERVED

Refer to **_Additional Components_** for more information about the component type associated with J6.

Related reference:

- Additional Components

J9: HP_PPS1

> ✎ **Note** High voltage up to 1500 VDC may be present on J9. The EA-PS 11500-30 is capable of sourcing up to 1500 VDC.

Figure 5. J9 Pinout
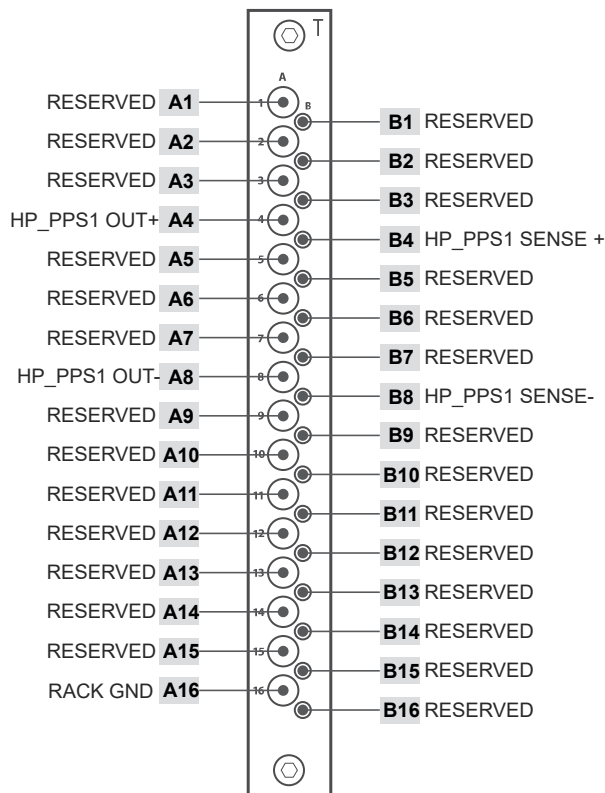
Refer to **Additional Components** for more information about the component type associated with J9.

Related reference:

- Additional Components

J11 and J12: Pulser Current Output

> ✎ **Note** High voltage up to 230 VDC may be present on J11 and J12. The RM-16061 can source up to 230 VDC as bias voltage.

Figure 6. J11 and J12 Pinouts

Refer to **_Pulser Components_** for more information about the component type associated with J11 and J12.

Related reference:

- Pulser Components

J13: DMM2 and MUX1

> **Note** High voltage up to 300 VDC may be present on J13. The PXIe-2527 and PXIe-4082 on J13 can be connected to up to 300 VDC.

Figure 7. J13 Pinout

	A	B	C	D
1	**A1** DMM2 HI	**B1** RESERVED	**C1** DMM2 HI SENSE	**D1** RESERVED
	A2 RESERVED	**B2** RESERVED	**C2** RESERVED	**D2** RESERVED
	A3 RESERVED	**B3** DMM2 LO	**C3** RESERVED	**D3** DMM2 LO SENSE
	A4 RESERVED	**B4** RESERVED	**C4** RESERVED	**D4** RESERVED
	A5 MUX1 CH0+	**B5** MUX1 CH2+	**C5** MUX1 CH4+	**D5** MUX1 CH6+
5	**A6** MUX1 CH0-	**B6** MUX1 CH2-	**C6** MUX1 CH4-	**D6** MUX1 CH6-
	A7 MUX1 CH1+	**B7** MUX1 CH3+	**C7** MUX1 CH5+	**D7** MUX1 CH7+
	A8 MUX1 CH1-	**B8** MUX1 CH3-	**C8** MUX1 CH5-	**D8** MUX1 CH7-
	A9 MUX1 CH8+	**B9** MUX1 CH10+	**C9** MUX1 CH12+	**D9** MUX1 CH14+
	A10 MUX1 CH8-	**B10** MUX1 CH10-	**C10** MUX1 CH12-	**D10** MUX1 CH14-
10	**A11** MUX1 CH9+	**B11** MUX1 CH11+	**C11** MUX1 CH13+	**D11** MUX1 CH15+
	A12 MUX1 CH9-	**B12** MUX1 CH11-	**C12** MUX1 CH13-	**D12** MUX1 CH15-
	A13 MUX1 COM0+	**B13** MUX1 1WREF0	**C13** MUX1 COM 1+	**D13** RESERVED
	A14 MUX1 COM0-	**B14** MUX1 1WREF1	**C14** MUX1 COM 1+	**D14** RESERVED
	A15 MUX1 CH16+	**B15** MUX1 CH18+	**C15** MUX1 CH20+	**D15** MUX1 CH22+
15	**A16** MUX1 CH16-	**B16** MUX1 CH18-	**C16** MUX1 CH20-	**D16** MUX1 CH22-
	A17 MUX1 CH17+	**B17** MUX1 CH19+	**C17** MUX1 CH21+	**D17** MUX1 CH23+
	A18 MUX1 CH17-	**B18** MUX1 CH19-	**C18** MUX1 CH21-	**D18** MUX1 CH23-
	A19 MUX1 CH24+	**B19** MUX1 CH26+	**C19** MUX1 CH28+	**D19** MUX1 CH30+
	A20 MUX1 CH24-	**B20** MUX1 CH26-	**C20** MUX1 CH28-	**D20** MUX1 CH30-
20	**A21** MUX1 CH25+	**B21** MUX1 CH27+	**C21** MUX1 CH29+	**D21** MUX1 CH31+
	A22 MUX1 CH25-	**B22** MUX1 CH27-	**C22** MUX1 CH29-	**D22** MUX1 CH31-
	A23 RESERVED	**B23** RESERVED	**C23** RESERVED	**D23** RESERVED
	A24 RESERVED	**B24** RESERVED	**C24** RESERVED	**D24** MUX1 SHIELD
25	**A25** RESERVED	**B25** RESERVED	**C25** RESERVED	**D25** RESERVED
	A26 RESERVED	**B26** RESERVED	**C26** RESERVED	**D26** RESERVED
	A27 RESERVED	**B27** RESERVED	**C27** RESERVED	**D27** RESERVED
	A28 RESERVED	**B28** RESERVED	**C28** RESERVED	**D28** RESERVED
	A29 RESERVED	**B29** RESERVED	**C29** RESERVED	**D29** RESERVED
30	**A30** RESERVED	**B30** RESERVED	**C30** RESERVED	**D30** RESERVED
	A31 RESERVED	**B31** RESERVED	**C31** RESERVED	**D31** RESERVED
	A32 RESERVED	**B32** RESERVED	**C32** RESERVED	**D32** RESERVED
	A33 RESERVED	**B33** RESERVED	**C33** RESERVED	**D33** RESERVED
	A34 RESERVED	**B34** RESERVED	**C34** RESERVED	**D34** RESERVED
35	**A35** RESERVED	**B35** RESERVED	**C35** RESERVED	**D35** RESERVED
	A36 RESERVED	**B36** RESERVED	**C36** RESERVED	**D36** RESERVED
	A37 RESERVED	**B37** RESERVED	**C37** RESERVED	**D37** RESERVED
	A38 RESERVED	**B38** RESERVED	**C38** RESERVED	**D38** RESERVED
	A39 RESERVED	**B39** RESERVED	**C39** RESERVED	**D39** RESERVED
40	**A40** RESERVED	**B40** RESERVED	**C40** RESERVED	**D40** RESERVED
	A41 RESERVED	**B41** RESERVED	**C41** RESERVED	**D41** RESERVED
	A42 RESERVED	**B42** RESERVED	**C42** RESERVED	**D42** RESERVED
	A43 RESERVED	**B43** RESERVED	**C43** RESERVED	**D43** RESERVED
	A44 RESERVED	**B44** RESERVED	**C44** RESERVED	**D44** RESERVED
45	**A45** RESERVED	**B45** RESERVED	**C45** RESERVED	**D45** RESERVED
	A46 RESERVED	**B46** RESERVED	**C46** RESERVED	**D46** RESERVED
	A47 RESERVED	**B47** RESERVED	**C47** RESERVED	**D47** RESERVED
48	**A48** RESERVED	**B48** RESERVED	**C48** RESERVED	**D48** RESERVED

Refer to **Additional Components** for more information about the component type associated with J13.

Related reference:

- Additional Components

J15: Pulser and Power Signals DAQ Voltage

> **Note** High voltage up to 1500 VDC may be present on J15. PULSER and PWRSIGDAQ voltage channels can accept input voltages up to 1500 VDC.

Figure 8. J15 Pinout

A	B	C	D
A1 RESERVED	B1 RESERVED	C1 RESERVED	D1 RESERVED
A2 RESERVED	B2 RESERVED	C2 RESERVED	D2 RESERVED
A3 RESERVED	B3 RESERVED	C3 RESERVED	D3 RESERVED
A4 RESERVED	B4 RESERVED	C4 RESERVED	D4 RESERVED
A5 RESERVED	B5 RESERVED	C5 RESERVED	D5 RESERVED
A6 RESERVED	B6 RESERVED	C6 RESERVED	D6 RESERVED
A7 PULSER VOLTAGE In 0 V+	B7 RESERVED	C7 RESERVED	D7 PULSER VOLTAGE In 0 V-
A8 RESERVED	B8 RESERVED	C8 RESERVED	D8 RESERVED
A9 PULSER VOLTAGE In 1 V+	B9 RESERVED	C9 RESERVED	D9 PULSER VOLTAGE In 1 V-
A10 RESERVED	B10 RESERVED	C10 RESERVED	D10 RESERVED
A11 PULSER VOLTAGE In 2 V+	B11 RESERVED	C11 RESERVED	D11 PULSER VOLTAGE In 2 V-
A12 RESERVED	B12 RESERVED	C12 RESERVED	D12 RESERVED
A13 RESERVED	B13 RESERVED	C13 RESERVED	D13 RESERVED
A14 RESERVED	B14 RESERVED	C14 RESERVED	D14 RESERVED
A15 RESERVED	B15 RESERVED	C15 RESERVED	D15 RESERVED
A16 RESERVED	B16 RESERVED	C16 RESERVED	D16 RESERVED
A17 RESERVED	B17 RESERVED	C17 RESERVED	D17 RESERVED
A18 PULSER VOLTAGE In 0 GND	B18 PULSER VOLTAGE In 1 GND	C18 RESERVED	D18 PULSER VOLTAGE In 2 GND
A19 PWRSIGDAQ1 VOLTAGE 0 GND	B19 PWRSIGDAQ1 VOLTAGE 1 GND	C19 PWRSIGDAQ1 VOLTAGE 2 GND	D19 PWRSIGDAQ1 VOLTAGE 3 GND
A20 PWRSIGDAQ1 VOLTAGE 4 GND	B20 PWRSIGDAQ1 VOLTAGE 5 GND	C20 PWRSIGDAQ1 VOLTAGE 6 GND	D20 PWRSIGDAQ1 VOLTAGE 7 GND
A21 RESERVED	B21 RESERVED	C21 RESERVED	D21 RESERVED
A22 RESERVED	B22 RESERVED	C22 RESERVED	D22 RESERVED
A23 RESERVED	B23 RESERVED	C23 RESERVED	D23 RESERVED
A24 RESERVED	B24 RESERVED	C24 RESERVED	D24 RESERVED
A25 RESERVED	B25 RESERVED	C25 RESERVED	D25 RESERVED
A26 RESERVED	B26 RESERVED	C26 RESERVED	D26 RESERVED
A27 RESERVED	B27 RESERVED	C27 RESERVED	D27 RESERVED
A28 PWRSIGDAQ1 VOLTAGE 0 V+	B28 RESERVED	C28 RESERVED	D28 PWRSIGDAQ1 VOLTAGE 0 V-
A29 RESERVED	B29 RESERVED	C29 RESERVED	D29 RESERVED
A30 PWRSIGDAQ1 VOLTAGE 1 V+	B30 RESERVED	C30 RESERVED	D30 PWRSIGDAQ1 VOLTAGE 1 V-
A31 RESERVED	B31 RESERVED	C31 RESERVED	D31 RESERVED
A32 PWRSIGDAQ1 VOLTAGE 2 V+	B32 RESERVED	C32 RESERVED	D32 PWRSIGDAQ1 VOLTAGE 2 V-
A33 RESERVED	B33 RESERVED	C33 RESERVED	D33 RESERVED
A34 PWRSIGDAQ1 VOLTAGE 3 V+	B34 RESERVED	C34 RESERVED	D34 PWRSIGDAQ1 VOLTAGE 3 V-
A35 RESERVED	B35 RESERVED	C35 RESERVED	D35 RESERVED
A36 PWRSIGDAQ1 VOLTAGE 4 V+	B36 RESERVED	C36 RESERVED	D36 PWRSIGDAQ1 VOLTAGE 4 V-
A37 RESERVED	B37 RESERVED	C37 RESERVED	D37 RESERVED
A38 PWRSIGDAQ1 VOLTAGE 5 V+	B38 RESERVED	C38 RESERVED	D38 PWRSIGDAQ1 VOLTAGE 5 V-
A39 RESERVED	B39 RESERVED	C39 RESERVED	D39 RESERVED
A40 PWRSIGDAQ1 VOLTAGE 6 V+	B40 RESERVED	C40 RESERVED	D40 PWRSIGDAQ1 VOLTAGE 6 V-
A41 RESERVED	B41 RESERVED	C41 RESERVED	D41 RESERVED
A42 PWRSIGDAQ1 VOLTAGE 7 V+	B42 RESERVED	C42 RESERVED	D42 PWRSIGDAQ1 VOLTAGE 7 V-
A43 RESERVED	B43 RESERVED	C43 RESERVED	D43 RESERVED
A44 RESERVED	B44 RESERVED	C44 RESERVED	D44 RESERVED
A45 RESERVED	B45 RESERVED	C45 RESERVED	D45 RESERVED
A46 RESERVED	B46 RESERVED	C46 RESERVED	D46 RESERVED
A47 RESERVED	B47 RESERVED	C47 RESERVED	D47 RESERVED
A48 RESERVED	B48 RESERVED	C48 RESERVED	D48 RESERVED

Refer to **Pulser Components** and **Power Signals DAQ** for more information about the component type associated with J15.

Related reference:

- Pulser Components
- Power Signals DAQ Components

J17: SMIO1 and PXI_PPS1

Figure 9. J17 Pinout

A	B	C	D
A1 CAN1 LO	B1 CAN1 Shield	C1 CAN2 Shield	D1 CAN2 LO
A2 CAN1 HI	B2 CAN1 Vsup	C2 CAN2 Vsup	D2 CAN2 HI
A3 CAN1 COM	B3 CAN1 COM	C3 CAN2 COM	D3 CAN2 COM
A4 CAN3 LO	B4 CAN3 SHIELD	C4 CAN4 SHIELD	D4 CAN4 LO
A5 CAN3 HI	B5 CAN3 Vsup	C5 CAN4 Vsup	D5 CAN4 HI
A6 CAN3 COM	B6 CAN3 COM	C6 CAN4 COM	D6 CAN4 COM
A7 No Connect	B7 LIN5 SHIELD	C7 LIN6 SHIELD	D7 No Connect
A8 LIN5	B8 LIN5 Vsup	C8 LIN6 Vsup	D8 LIN6
A9 LIN5 COM	B9 LIN5 COM	C9 LIN6 COM	D9 LIN6 COM
A10 AUTO-ENET 1 TRX_P	B10 AUTO-ENET 2 TRX_P	C10 AUTO-ENET 3 TRX_P	D10 AUTO-ENET 4 TRX_P
A11 AUTO-ENET 1 TRX_M	B11 AUTO-ENET 2 TRX_M	C11 AUTO-ENET 3 TRX_M	D11 AUTO-ENET 4 TRX_M
A12 AUTO-ENET 5 TRX_P	B12 AUTO-ENET 6 TRX_P	C12 AUTO-ENET 7 TRX_P	D12 AUTO-ENET 8 TRX_P
A13 AUTO-ENET 5 TRX_M	B13 AUTO-ENET 6 TRX_M	C13 AUTO-ENET 7 TRX_M	D13 AUTO-ENET 8 TRX_M
A14 FLEXRAY 1 VBAT	B14 FLEXRAY 1 BP A	C14 FLEXRAY 2 BM A	D14 FLEXRAY T1
A15 RESERVED	B15 FLEXRAY 1 BM A	C15 FLEXRAY 2 BP A	D15 FLEXRAY 2 COM
A16 FLEXRAY 1 COM	B16 FLEXRAY 1 BP B	C16 FLEXRAY 2 BM B	D16 RESERVED
A17 FLEXRAY T0	B17 FLEXRAY 1 BM B	C17 FLEXRAY 2 BP B	D17 FLEXRAY 2 VBAT
A18 T0 SHIELD	B18 SHIELD	C18 SHIELD	D18 T1 SHIELD
A19 SMIO1 AI0+	B19 SMIO1 AI1+	C19 SMIO1 AI2+	D19 SMIO1 AI3+
A20 SMIO1 AI0-	B20 SMIO1 AI1-	C20 SMIO1 AI2-	D20 SMIO1 AI3-
A21 SMIO1 AIGND0	B21 SMIO1 AIGND1	C21 SMIO1 AIGND2	D21 SMIO1 AIGND3
A22 SMIO1 AI4+	B22 SMIO1 AI5+	C22 SMIO1 AI6+	D22 SMIO1 AI7+
A23 SMIO1 AI4-	B23 SMIO1 AI5-	C23 SMIO1 AI6-	D23 SMIO1 AI7-
A24 SMIO1 AIGND4	B24 SMIO1 AIGND5	C24 SMIO1 AIGND6	D24 SMIO1 AIGND7
A25 SMIO1 RSVD/AISENSE	B25 SMIO1 APFI0	C25 SMIO1 AO0	D25 SMIO1 AO1
A26 SMIO1 +5V	B26 SMIO1 SHIELD	C26 SMIO1 AOGND0	D26 SMIO1 AOGND1
A27 SMIO1 P0.0	B27 SMIO1 P0.1	C27 SMIO1 P0.2	D27 SMIO1 P0.3
A28 SMIO1 DGND0	B28 SMIO1 DGND1	C28 SMIO1 DGND2	D28 SMIO1 DGND3
A29 SMIO1 P0.4	B29 SMIO1 P0.5	C29 SMIO1 P0.6	D29 SMIO1 P0.7
A30 SMIO1 P1.0	B30 SMIO1 P1.1	C30 SMIO1 P1.2	D30 SMIO1 P1.3
A31 SMIO1 DGND4	B31 SMIO1 DGND5	C31 SMIO1 DGND6	D31 SMIO1 DGND7
A32 SMIO1 P1.4	B32 SMIO1 P1.5	C32 SMIO1 P1.6	D32 SMIO1 P1.7
A33 SMIO1 P2.0	B33 SMIO1 P2.1	C33 SMIO1 P2.2	D33 SMIO1 P2.3
A34 SMIO1 DGND8	B34 SMIO1 DGND9	C34 SMIO1 DGND10	D34 SMIO1 DGND11
A35 SMIO1 P2.4	B35 SMIO1 P2.5	C35 SMIO1 P2.6	D35 SMIO1 P2.7
A36 PXI_PPS1 CHSGND	B36 PXI_PPS1 CHSGND	C36 RESERVED	D36 RESERVED
A37 RESERVED	B37 RESERVED	C37 RESERVED	D37 RESERVED
A38 RESERVED	B38 PXI_PPS1 OUT0+	C38 PXI_PPS1 SENSE1+	D38 RESERVED
A39 PXI_PPS1 SENSE0+	B39 PXI_PPS1 OUT0-	C39 PXI_PPS1 SENSE1-	D39 PXI_PPS1 OUT1+
A40 PXI_PPS1 SENSE0-	B40 RESERVED	C40 RESERVED	D40 PXI_PPS1 OUT1-
A41 RESERVED	B41 RESERVED	C41 RESERVED	D41 RESERVED
A42 RESERVED	B42 RESERVED	C42 RESERVED	D42 RESERVED
A43 RESERVED	B43 RESERVED	C43 RESERVED	D43 RESERVED
A44 AO1 AO0+	B44 AO1 AO1+	C44 AO1 AO2+	D44 AO1 AO3+
A45 AO1 AO0-	B45 AO1 AO1-	C45 AO1 AO2-	D45 AO1 AO3-
A46 AO1 AO4+	B46 AO1 AO5+	C46 AO1 AO6+	D46 AO1 AO7+
A47 AO1 AO4-	B47 AO1 AO5-	C47 AO1 AO6-	D47 AO1 AO7-
A48 RESERVED	B48 RESERVED	C48 RESERVED	D48 RESERVED

Refer to **Additional Components** for more information about the component type associated with J17.

Related reference:

- Additional Components

J18: Pulser and Power Signals DAQ Current

Figure 10. J18 Pinout

A	B	C	D
A1 PWRSIGDAQ1 CURRENT 0 AI+	B1 PWRSIGDAQ1 CURRENT 1 AI+	C1 PWRSIGDAQ1 CURRENT 2 AI+	D1 PWRSIGDAQ1 CURRENT 3AI+
A2 PWRSIGDAQ1 CURRENT 0 AI-	B2 PWRSIGDAQ1 CURRENT 1 AI-	C2 PWRSIGDAQ1 CURRENT 2 AI-	D2 PWRSIGDAQ1 CURRENT 3AI-
A3 PWRSIGDAQ1 CURRENT 0 STATUS	B3 PWRSIGDAQ1 CURRENT 1 STATUS	C3 PWRSIGDAQ1 CURRENT 2 STATUS	D3 PWRSIGDAQ1 CURRENT 3 STATUS
A4 PWRSIGDAQ1 CURRENT 0 STATUS GND	B4 PWRSIGDAQ1 CURRENT 1 STATUS GND	C4 PWRSIGDAQ1 CURRENT 2 STATUS GND	D4 PWRSIGDAQ1 CURRENT 3 STATUS GND
A5 PWRSIGDAQ1 CURRENT 0 SUPPLY+	B5 PWRSIGDAQ1 CURRENT 1 SUPPLY+	C5 PWRSIGDAQ1 CURRENT 2 SUPPLY+	D5 PWRSIGDAQ1 CURRENT 3 SUPPLY+
A6 PWRSIGDAQ1 CURRENT 0 GND	B6 PWRSIGDAQ1 CURRENT 1 GND	C6 PWRSIGDAQ1 CURRENT 2 GND	D6 PWRSIGDAQ1 CURRENT 3 GND
A7 PWRSIGDAQ1 CURRENT 0 SUPPLY-	B7 PWRSIGDAQ1 CURRENT 1 SUPPLY-	C7 PWRSIGDAQ1 CURRENT 2 SUPPLY-	D7 PWRSIGDAQ1 CURRENT 3 SUPPLY-
A8 SHIELD	B8 SHIELD	C8 SHIELD	D8 SHIELD
A9 PWRSIGDAQ1 CURRENT 4 AI+	B9 PWRSIGDAQ1 CURRENT 5 AI+	C9 PWRSIGDAQ1 CURRENT 6 AI+	D9 RESERVED
A10 PWRSIGDAQ1 CURRENT 4 AI-	B10 PWRSIGDAQ1 CURRENT 5 AI-	C10 PWRSIGDAQ1 CURRENT 6 AI-	D10 RESERVED
A11 PWRSIGDAQ1 CURRENT 4 STATUS	B11 PWRSIGDAQ1 CURRENT 5 STATUS	C11 PWRSIGDAQ1 CURRENT 6 STATUS	D11 RESERVED
A12 PWRSIGDAQ1 CURRENT 4 STATUS GND	B12 PWRSIGDAQ1 CURRENT 5 STATUS GND	C12 PWRSIGDAQ1 CURRENT 6 STATUS GND	D12 RESERVED
A13 PWRSIGDAQ1 CURRENT 4 SUPPLY+	B13 PWRSIGDAQ1 CURRENT 5 SUPPLY+	C13 PWRSIGDAQ1 CURRENT 6 SUPPLY+	D13 RESERVED
A14 PWRSIGDAQ1 CURRENT 4 GND	B14 PWRSIGDAQ1 CURRENT 5 GND	C14 PWRSIGDAQ1 CURRENT 6 GND	D14 RESERVED
A15 PWRSIGDAQ1 CURRENT 4 SUPPLY-	B15 PWRSIGDAQ1 CURRENT 5 SUPPLY-	C15 PWRSIGDAQ1 CURRENT 6 SUPPLY-	D15 RESERVED
A16 SHIELD	B16 SHIELD	C16 SHIELD	D16 RESERVED
A17 PULSER CURRENT In 0 AI+	B17 PULSER CURRENT In 1 AI+	C17 PULSER CURRENT In 2 AI+	D17 RESERVED
A18 PULSER CURRENT In 0 AI-	B18 PULSER CURRENT In 1 AI-	C18 PULSER CURRENT In 2 AI-	D18 RESERVED
A19 PULSER CURRENT In 0 STATUS	B19 PULSER CURRENT In 1 STATUS	C19 PULSER CURRENT In 2 STATUS	D19 RESERVED
A20 PULSER CURRENT In 0 STATUS GND	B20 PULSER CURRENT In 1 STATUS GND	C20 PULSER CURRENT In 2 STATUS GND	D20 RESERVED
A21 PULSER CURRENT In 0 SUPPLY+	B21 PULSER CURRENT In 1 SUPPLY+	C21 PULSER CURRENT In 2 SUPPLY+	D21 RESERVED
A22 PULSER CURRENT In 0 GND	B22 PULSER CURRENT In 1 GND	C22 PULSER CURRENT In 2 GND	D22 RESERVED
A23 PULSER CURRENT In 0 SUPPLY-	B23 PULSER CURRENT In 1 SUPPLY-	C23 PULSER CURRENT In 2 SUPPLY-	D23 RESERVED
A24 SHIELD	B24 SHIELD	C24 SHIELD	D24 RESERVED
A25 RESERVED	B25 RESERVED	C25 RESERVED	D25 RESERVED
A26 RESERVED	B26 RESERVED	C26 RESERVED	D26 RESERVED
A27 RESERVED	B27 RESERVED	C27 RESERVED	D27 RESERVED
A28 RESERVED	B28 RESERVED	C28 RESERVED	D28 RESERVED
A29 RESERVED	B29 RESERVED	C29 RESERVED	D29 RESERVED
A30 RESERVED	B30 RESERVED	C30 RESERVED	D30 RESERVED
A31 RESERVED	B31 RESERVED	C31 RESERVED	D31 RESERVED
A32 RESERVED	B32 RESERVED	C32 RESERVED	D32 RESERVED
A33 RESERVED	B33 RESERVED	C33 RESERVED	D33 RESERVED
A34 RESERVED	B34 RESERVED	C34 RESERVED	D34 RESERVED
A35 RESERVED	B35 RESERVED	C35 RESERVED	D35 RESERVED
A36 RESERVED	B36 RESERVED	C36 RESERVED	D36 RESERVED
A37 RESERVED	B37 RESERVED	C37 RESERVED	D37 RESERVED
A38 RESERVED	B38 RESERVED	C38 RESERVED	D38 RESERVED
A39 RESERVED	B39 RESERVED	C39 RESERVED	D39 RESERVED
A40 RESERVED	B40 RESERVED	C40 RESERVED	D40 RESERVED
A41 RESERVED	B41 RESERVED	C41 RESERVED	D41 RESERVED
A42 RESERVED	B42 RESERVED	C42 RESERVED	D42 RESERVED
A43 RESERVED	B43 RESERVED	C43 RESERVED	D43 RESERVED
A44 RESERVED	B44 RESERVED	C44 RESERVED	D44 RESERVED
A45 RESERVED	B45 RESERVED	C45 RESERVED	D45 RESERVED
A46 RESERVED	B46 RESERVED	C46 RESERVED	D46 RESERVED
A47 RESERVED	B47 RESERVED	C47 RESERVED	D47 RESERVED
A48 RESERVED	B48 RESERVED	C48 RESERVED	D48 RESERVED

Refer to **Pulser Components** and **Power Signals DAQ** for more information about the component type associated with J18.

Related reference:

- Pulser Components
- Power Signals DAQ Components

Input Voltage for the Power Entry Panel

Input voltage range information is located in the ***ETX-16201/16202/16203/16209 User Manual*** and ***ETX-16201/16202/16203/16209 Specifications***.

> ⚠ **Caution** To completely interrupt power to a three phase system, you must switch off the main breaker on the Power Entry Panel. Position equipment so that it is easy to access the main breaker.

> ⚠ **Attention** Pour interrompre complètement l'alimentation d'un système triphasé, vous devez éteindre le disjoncteur principal sur le panneau d'entrée d'alimentation. Positionner l'équipement de sorte qu'il soit facile d'accéder au disjoncteur principal.

> ✎ **Note** Ensure the system is positioned to allow you to easily disconnect power.

The power entry panel is the RMX-10140-50D2P.

Table 2. Input Voltage Range

Overvoltage category	II
Branch circuit rating	63 A
Voltage rating	208 V 3P+PE
Frequency	50 Hz or 60 Hz
Current rating	50 A

> ⚠ **Notice** Refer to the ***ETX-16201/16202/16203/16209 User Manual*** for more information on your power entry panel's power requirements and fuse information.

Field Wiring Cable Specifications

The field wiring cable supplies power and protective earth for the ETX-1620x through internal terminal connections. Before performing initial power setup, you must provide a field wiring cable that meets the requirements in the following table.

Field wiring cable specification information is located in the ***ETX-16201/16202/16203/16209 User Manual*** and ***ETX-16201/16202/16203/16209 Specifications***.

> ⚠ **Caution** Ensure that the field wiring cable preparation and power configuration is performed only by qualified personnel.

> ⚠ **Attention** Assurez-vous que la préparation du câblage sur site et la configuration de l'alimentation sont effectuées uniquement par du personnel qualifié.

> ✎ **Note** High levels of leakage current might be present on the product. Connect the product to the protective earth terminal before connecting to AC power.

> ✎ **Note** The facility installation must provide a means for connection to protective earth, and qualified personnel must install a protective earthing conductor from the protective earthing terminal on the product to the protective earth wire in the facility.

> ✎ **Note** Only use copper wire to connect the protective earthing terminal of your product to the protective earth wire in the facility.

Table 3. Field Wiring Cable Requirements

Outer diameter of the input power cable	22.2 mm to 32 mm
Ground wiring	2.5 mm^2 to 70 mm^2 (14 AWG to 2/0 AWG)
Wire strip length	15.7 mm (0.6 in.)

L1, L2, and L3 wiring	10 mm^2 to 35 mm^2 (8 AWG to 2 AWG) with M6 ring lugs installed
Minimum insulator temperature rating	90 °C (194 °F)

Receiver Ratings

The mass interconnect modules in the following table are capable of sourcing hazardous voltages.

Table 4. Maximum Output Voltage by Module

Module	Maximum Output Voltage
J9	1500 VDC
J11	230 VDC

Hazardous voltages may be applied to the modules in the following table.

Table 5. Maximum Input Voltage by Module

Module	Maximum Input Voltage (Maximum Voltage Sink)
J11	230 VDC
J12	230 VDC
J13	300 VDC
J15	1500 VDC

Pulser Specifications

Learn about specifications for the pulser and RM-16061. For complete NI specifications, visit `ni.com/docs` and search by model number.

Pulser specification information is located in the ***ETX-16201/16202/16203/16209 User Manual*** and ***ETX-16201/16202/16203/16209 Specifications***.

The pulser generates a trapezoidal pulse.

- The pulser bias supply is an isolated supply that connects to outputs A0 (V+) and A1 (V-) on J11. Bias supply current and voltage are available only between these two pins.
- The pulse is a low voltage, ground referenced signal with a maximum potential of 20 V. If one of the bias outputs is in the pulse path, the bias supply becomes ground referenced during the pulse. It is critical that the pulser is the only connection to ground reference the DUT.
- The bias supply can power the DUT while taking measurements with the pulser. Do not pulse across the bias supply. Pulses are intended to be across other signal paths in the DUT. To protect the bias supply, the pulser does not allow pulses across A0 and A1. You can configure a pulse between A0 or A1 and another PULSER CURRENT OUTPUT on J11 or J12 while the bias supply is active.

Figure 11. Pulse Waveform
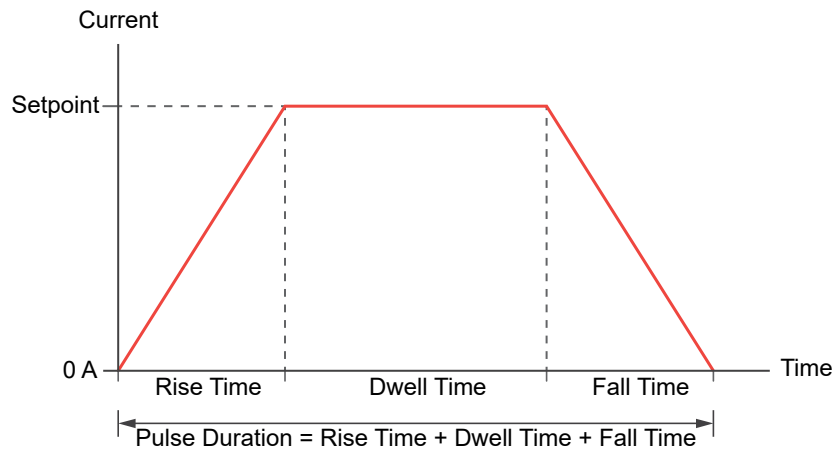
Table 6. Pulser Output

Maximum pulse current	1200 A Maximum pulse current is the maximum supported value for the setpoint.
Maximum bias voltage	230 V
Maximum bias current	3 A
Maximum slew rate	1 A/µs
Minimum rise time	1 µs/A × Setpoint
Minimum fall time	1 µs/A × Setpoint

Maximum pulse duration	10 ms

Table 7. Pulse Path Wiring

Rating	300 V, minimum
Minimum insulator temperature rating	90 °C
Material	Copper
Size	35 mm^2 (2 AWG)

Pulser Waveform Examples

- **Minimum Rise Time**—A setpoint of 1000 A and maximum slew rate of 1 A/μs yields minimum rise time of 1000 A ÷ 1 A/μs = 1 ms.
- **Required Slew Rate**—A setpoint of 500 A with a desired 1 ms fall time requires a slew rate of 0.5 A/μs. This is possible because 0.5 A/μs is lower than the maximum supported slew rate of 1 A/μs.
- **Pulse Duration**—For a pulse with rise time of 1 ms, dwell time of 5 ms, and fall time of 2 ms, the pulse duration is 1 ms + 5 ms + 2 ms = 8 ms. This is possible because 8 ms is shorter than the maximum supported pulse duration of 10 ms.

Pulse Current Multiplexer Specifications

The RM-16061 functions as a pulse current multiplexer in the ETX-1620x. Pulse current multiplexer specification information is located in the *ETX-16201/16202/16203/ 16209 User Manual* and *ETX-16201/16202/16203/16209 Specifications*.

Table 8. RM-16061 Input

Power	24 VDC, 3 A
Charge	20 VDC, 10 A
Bias	230 VDC, 3 A
Pulse/load bus bar ratings	20 VDC, 1200 A

Table 9. Replacement I/O Connectors

Connector Name	Vendor	Part Number
Bias	Phoenix Contact	1777808
Charge	Weidmuller	2459570000
Power	Phoenix Contact	1703350

Table 10. RM-16061 Ground Terminal

Ground screw	M4 × 0.7
Maximum torque	1.92 N · m (17.0 lb · in.)

RM-16061 Fuse

The RM-16061 has a user serviceable time-delay fuse.

Table 11. RM-16061 Fuse

Current rating	12 A
Voltage rating	20 VDC minimum
Size and dimensions	5.2 mm × 20 mm
Type	Time-delay
Interrupt rating	300 A
Recommended replacement	Eaton BK1-S505H(-V)-12-R

ETX-1620x Physical Characteristics

Ensure the location, including passageways and elevators, can accommodate the size and weight of the ETX-1620x. Physical characteristic information is located in the *ETX-16201/16202/16203/16209 User Manual* and *ETX-16201/16202/16203/16209 Specifications*.

Table 12. Physical Characteristics and Rack Air Circulation

Dimensions	1053 mm × 679 mm × 1971 mm (41.5 in. × 26.7 in. × 77.6 in.)
Maximum weight	440 kg (970 lbs)

Acoustic emissions	64 dB, 1 m away

Ventilation Clearances

Ventilation clearances are required to ensure proper airflow. Ensure obstructions are outside the following clearance requirements. Ventilation clearance information is located in the *ETX-16201/16202/16203/16209 User Manual* and *ETX-16201/16202/16203/16209 Specifications*.

Table 13. Minimum Cooling Clearances

Left and right sides	0 mm (0 in.)
ITA side	0 mm (0 in.)
HMI side	305 mm (12 in.)
Top	508 mm (20 in.)

> (!) **Notice** The intake temperature must be within the operating specifications.

Environmental Characteristics

Environmental characteristic information is located in the *ETX-16201/16202/16203/16209 User Manual* and *ETX-16201/16202/16203/16209 Specifications*.

Table 14. Environmental Characteristics

Operating temperature	5 °C to 32 °C
Storage temperature	0 °C to 60 °C
Operating humidity	10% RH to 80% RH, noncondensing
Storage humidity	5% RH to 80% RH, noncondensing
Pollution degree	2
Maximum altitude	2000 m

Hardware Components

The following components are used within the ETX-1620x. Hardware component information is located in the ***ETX-16201/16202/16203/16209 User Manual*** and ***ETX-16201/16202/16203/16209 Specifications***.

> **Note** Detailed specifications for hardware components are available online at `ni.com/docs`.

Pulser Components

The pulser can create brief, high current pulses that you can use to take measurements. The pulser includes a bias supply that can power a DUT in preparation to receive a pulse.

Table 15. Pulser Components

Component Type	Model, NI Part Number	Resource Name	Ratings Override	PXI Chassis Slot	Mass Interconnect Slot
Pulse current multiplexer	RM-16061, 138834-01	PULSER_MUX1	—	—	J11 and J12
Electronic load	PEL-3111, 756658-01	PULSER_ELOAD1	—	—	—
	PEL-3211 (Quantity: 3), 756659-01	PULSER_ELOAD_BOOSTER1 PULSER_ELOAD_BOOSTER2 PULSER_ELOAD_BOOSTER3	—	—	—
Power supply	RMX-41011, 786006-01	PULSER_CHARGE_PPS1	—	—	—

Component Type	Model, NI Part Number	Resource Name	Ratings Override	PXI Chassis Slot	Mass Interconnect Slot
	RMX-4122, 782857-01	PULSER_BIAS_PPS1	—	—	—
Power measurements conditioner	RM-26999, 786328-01	PULSER_PMC1	1500 VDC, Category I Supported transducers: • DS50UB-10V • DS200UB-10V • DS600UB-10V • DM1200UB-10V • DL2000UB-10V	—	J15 and J18
Multifunction I/O	PXIe-6366, 781057-01	PULSER_SMIO	—	16	—
Current transducer	DM1200UB-10V, 788929-01	PULSER_TRANSDUCER1	—	—	—

Refer to **Pulser Specifications** for more information about the pulser.

Related information:

- Pulser Specifications

Power Signals DAQ Components

Use the Power Signals DAQ to perform voltage and current measurements in the ETX-1620x.

Table 16. Power Signals DAQ Components

Component Type	Model, NI Part Number	Resource name	Ratings Override	PXI Chassis Slot	Mass Interconnect Slot
Multifunction I/O	PXIe-6368, 785926-01	PWRSIGDAQ1_SMIO1	—	17	—
Power measurements conditioner	RM-26999 (Quantity: 2), 786328-01	PWRSIGDAQ1_PMC1 PWRSIGDAQ1_PMC2	1500 VDC, Category I Supported transducers: • DS50UB-10V • DS200UB-10V • DS600UB-10V • DM1200UB-10V • DL2000UB-10V	—	J15 and J18
Current transducer	DS50UB-10V, 786956-01	PWRSIGDAQ1_TRANSDUCER1	—	—	—

Additional Components

The following components are independent of the composite instruments, and you can configure and use these components individually in the ETX-1620x. Additional components have an NI part number unless otherwise noted.

Table 17. Additional Components

Component type	Model, NI Part Number	Resource Name	Ratings Override	PXI Chassis Slot	Mass Interconnect Slot
PXI chassis	PXIe-1084, 784058-01	PXIChassis1	—	—	—
PXI controller	PXIe-8862, Contact NI	User-specified	—	1	—
Digital multimeter	PXIe-4082, 783131-01	DMM1	±60 V	6	J4
	PXIe-4082, 783131-01	DMM2	±300 V	8	J13
Multifunction I/O	PXIe-6366, 781057-01	SMIO1	—	12	J17
Power supply	PXIe-4112, 782857-01	PXI_PPS1	—	11	J17
	RMX-41041, 786014-01	RMX_PPS1	—	—	J6
	EA-PS 11500-30[1], 789716-01	HP_PPS1	1500 V, 30 A, 10 kW	—	J9
Source	PXIe-4139,	SMU1	—	7	J4

1. The ETX-16209 has a different power supply than the other ETX models. Refer to ETX-16209 specific supplemental documentation for more information.

Component type	Model, NI Part Number	Resource Name	Ratings Override	PXI Chassis Slot	Mass Interconnect Slot
measure unit	782856-02				
Relay driver	PXI-2567, 778572-67	RELAY_DRIVER1	16 channels (CH0 through CH15)	2	J1
Multiplexer	PXIe-2527, 780587-27	MUX1	—	9	J13
Matrix	PXIe-2737, 782835-37	MATRIX1	—	5	J4
Bank-isolated digital I/O module	PXI-6528, 778543-01	DIO1	32 channels (16 source/ sink inputs in 2 banks, 16 source/sink outputs in 2 banks)	3	J1
Analog output	PXIe-4322, 782878-01	AO1	—	13	J17
RS232 serial instrument control module	PXIe-8430/8, 781472-01	COM2 COM3	2-port	4	J1
CAN/LIN	PXIe-8510, 784122-01	CAN1 CAN2 CAN3	4 CAN channels 2 LIN	18	J17

Component type	Model, NI Part Number	Resource Name	Ratings Override	PXI Chassis Slot	Mass Interconnect Slot
		CAN4 LIN5 LIN6	channels[2]		
FlexRay	PXI-8517, 780689-02	FlexRay1 FlexRay2	2 ports	14	J17
Automotive Ethernet	PXIe-8523, 87311-01	ENET1 ENET2 ENET3 ENET4	4 channels[3]	15	J17

Note Refer to the ETX model number (ETX-1620x) in ***ETX Inverter Production Test System Models*** to determine which vehicle communication option your system includes.

Related information:

- ETX Inverter Production Test System Models

2. The CAN connection is through the TRC-8543, and the LIN connection is through the TRC-8546.
3. The PXIe-8523 has four channels of 100/1000BASE-T1 automotive Ethernet. ETX-16202 only supports 1000BASE-T1 on one channel at a time; it supports 100BASE-T1 simultaneously on up to all four channels.