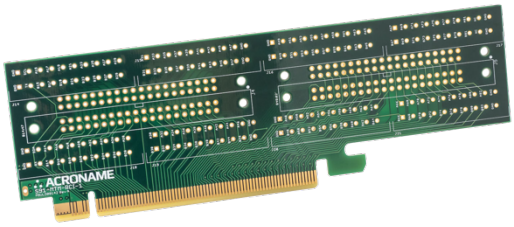

Overview

The Acroname® MTM Ribbon Cable Interface (MTM-RCI-1), part of Acroname's MTM (Manufacturing Test Module) product series, is a connectivity option designed for integration with MTM-based testers. The MTM-RCI-1 allows MTM system designers to easily and quickly bridge external devices or instrumentation to an MTM-based test point carrier board.

Ideal for use in high-reliability manufacturing or development testing environments, MTM-RCI-1 bridges an MTM socket to ribbon cable or terminal connectors.

Typical Application

- Manufacturing functional testing
- Validation testing
- Automated test development
- Embedded system development

System Features

- Low-density connector footprints for standard headers or screw terminals
- MTM edge connector with access to 164 pins
- Customizable to support direct wire soldering, ribbon cable connectors or screw terminal options

Description

The MTM-RCI-1 interface board is a convenient component for manufacturing test solutions implementing MTM which also need to bridge in external equipment. BrainStem® interface and APIs are at https://acroname.com/reference.

The MTM-RCI-1 bridges an MTM edge connector to low-density pads for easy external access.

The high-density connections of the MTM modules are broken out to low-density 0.1" spaced connections as well as 3.5mm-spaced connections. Headers, screw terminals or ribbon cable connectors can be installed to customize the connectivity needed in a given test system.

IMPORTANT NOTE

The MTM-RCI-1 utilizes a PCIe connector interface but is for use strictly in MTM-based systems. It should never be installed in a PCI slot of a host computer directly. Insertion into a PC or non-MTM system could cause damage to the PC.

Absolute Maximum Ratings

Stresses beyond those listed under ABSOLUTE MAXIMUM RATINGS can cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under RECOMMENDED OPERATING CONDITIONS is not implied. Exposure to absolute-maximum rated conditions for extended periods affects device reliability and may permanently damage the device.

Rating	Minimum	Maximum	Units
Voltage to any IO pin	-	-	V
Current to any IO pin	-6	6	A

Table 1: Absolute Maximum Ratings

Handling Ratings

Parameter	Conditions/Notes	Minimum	Typical	Maximum	Units
Ambient Operating Temperature, T_A	Non-Condensing	0	25	70	°C
Relative Humidity Range	Non-Condensing	5	-	95	%RH
Storage Temperature, T_{STG}		-10	-	85	°C

Table 2: Handling Ratings

Recommended Operating Ratings

Specifications are valid at 25°C unless otherwise noted. Intended for indoor use only.

Parameter	Conditions/Notes	Minimum	Typical	Maximum	Units
Voltage to any IO pin		-	-	-	V
Current to any IO pin		0	-	1.0	A
Relative Humidity Range	Non-Condensing	5	-	95	%RH

Table 3: Recommended Operating Ratings

Block Diagram

Showing populated and not populated (NP) connectors:

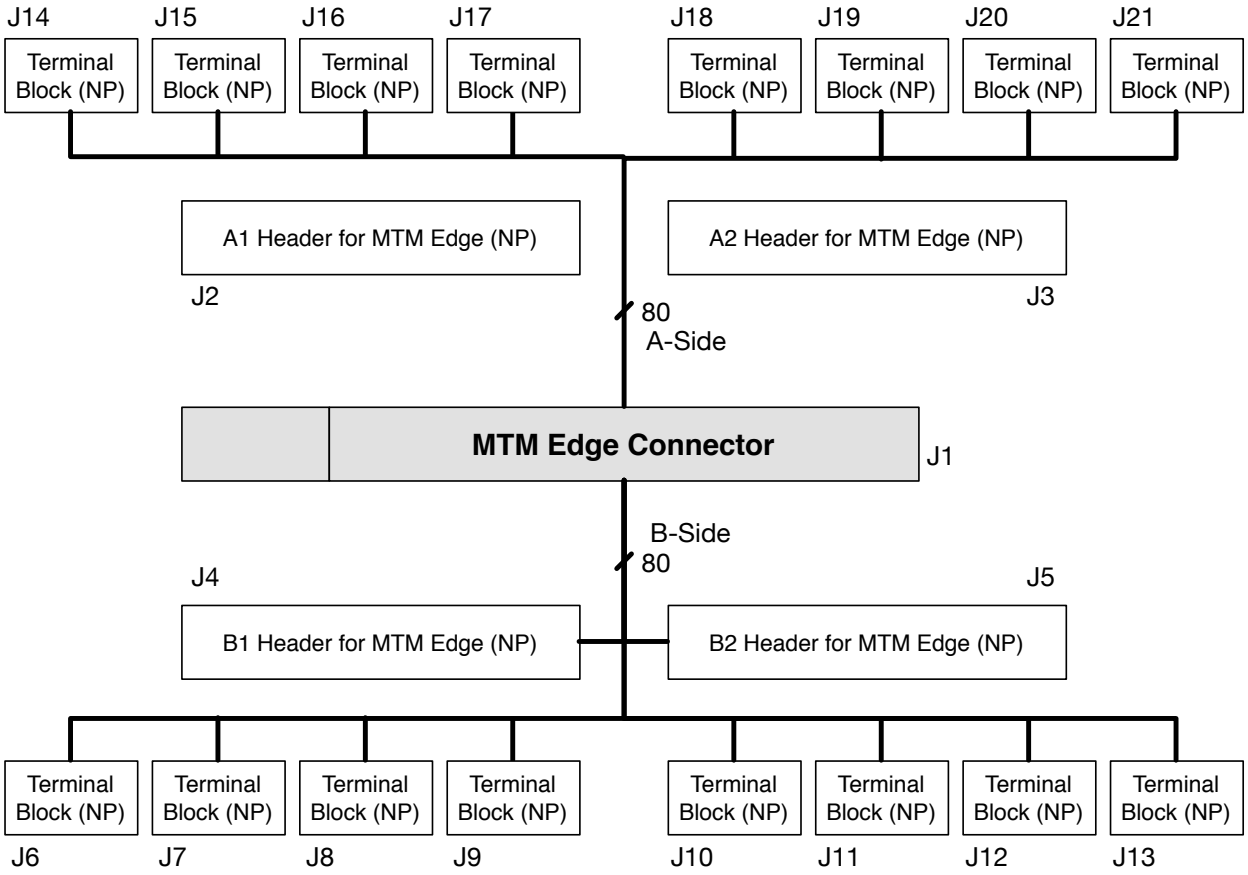

Figure 1: MTM-RCI-1 Block Diagram

Typical Applications

Automated functional circuit test (FCT) using MTM-RCI-1 to bridge external equipment to an MTM test point carrier board (TPCB):

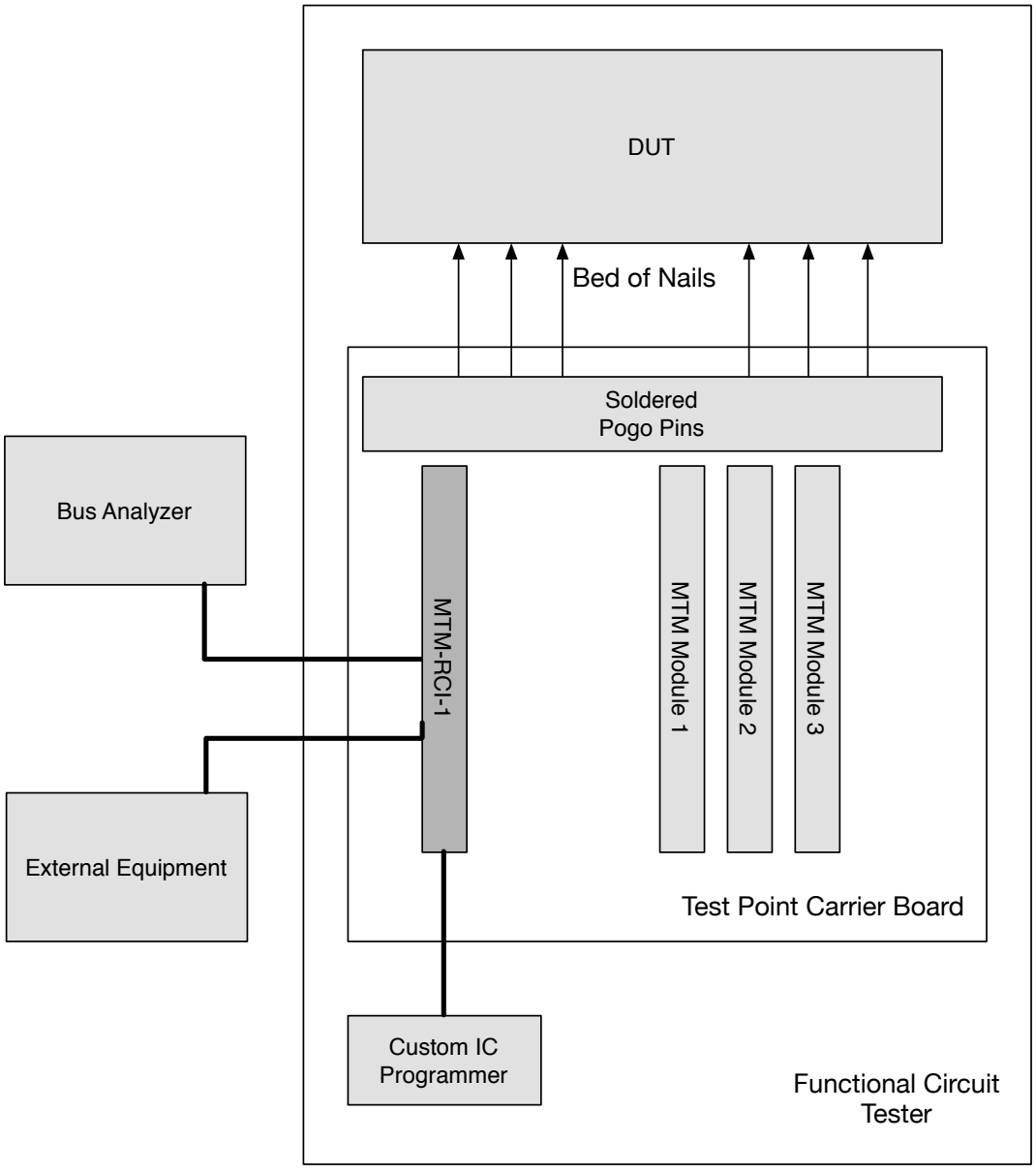

Figure 2: MTM-RCI-1 Bridging external equipment to an MTM-based tester

Pinout Descriptions

WARNING: MTM modules use a PCIe connector interface that is common in most desktop computers; however, they are NOT intended nor designed to work in these devices. Do NOT insert this product into any PCIe slot that wasn't specifically designed for MTM modules, such as a host PC. Installing this module into a standard PCIe slot will result in damage to the module and the PC.

The MTM edge connector pin assignments are shown in the following table. An MTM-RCI-1 module is shown below:

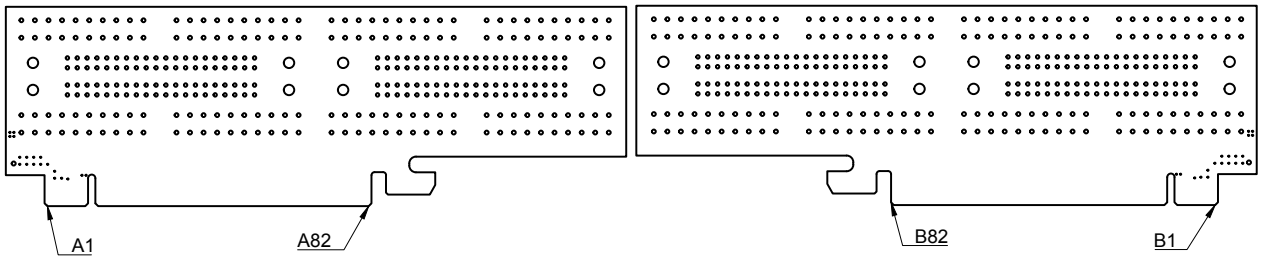

Figure 3: MTM-RCI-1 A and B sides.

Pins Common to all MTM Modules

Side A	Edge Connector Side A Description	Breakout A1	Side B	Edge Connector Side B Description	Breakout B1
A1	GND		B1	Input Voltage, V_{supply}	
A2	GND		B2	Input Voltage, V_{supply}	
A3	GND		B3	Input Voltage, V_{supply}	
A4	GND		B4	Input Voltage, V_{supply}	
A5	Reset[2]		B5	Input Voltage, V_{supply}	
A6	GND		B6	Reserved, Do Not Connect	
A7	GND		B7	Reserved, Do Not Connect	
A8	I²C0 SCL[1]		B8	GND	
A9	I²C0 SDA[1]		B9	GND	
A10	GND		B10	UART0 Tx[3]	
A11	GND		B11	UART0 Rx[3]	
A12	Reserved, Do Not Connect		B12	Reserved, Do Not Connect	
A13	Reserved, Do Not Connect		B13	Reserved, Do Not Connect	

Table 4: MTM Common Pins with Signal Definitions

[1] I²C0 SCL and SDA nets are connected to all MTM module sockets of an MTM system and may carry BrainStem bus communication.
[2] Reset net is connected to all MTM module sockets of an MTM system.
[3] UART0 Tx and Rx may be brought in from another MTM module in an MTM system.

Pinout Information

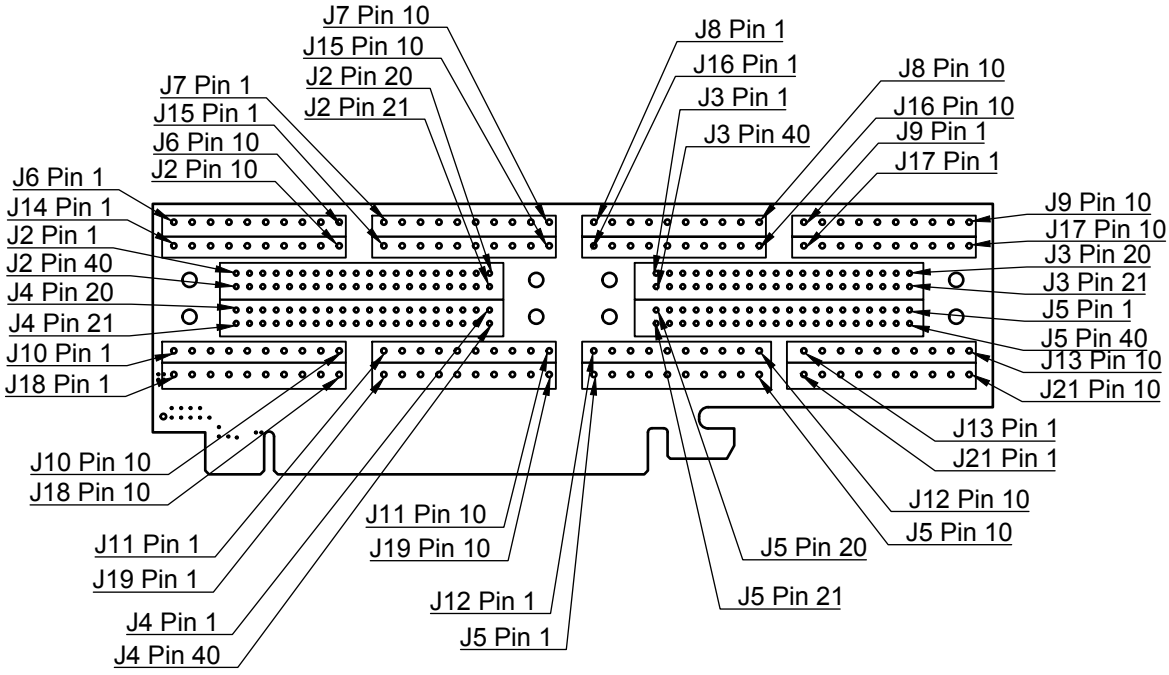

Figure 4: MTM-RCI-1 Connector designators and pin 1 positions.

Edge	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14	J15	J16	J17	J18	J19	J20	J21
See Table 4: MTM Common Pins with Signal Definitions																				
A1 A2 A3 A4 A6 A7 A10 A11 B8 B9	1 20 21 40	1 20 21 40	1 20 21 40	1 20 21 40	1	10	1	10	1	10	1	10	1	10	1	10	1	10	1	10
A5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A8	2	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A9	39	-	-	-		-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
B1 B2 B3 B4 B5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10	-	-	19	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
B11	-	-	22	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
B12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Policy Free Connections Follow																				
A14	38	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-
B14		-	23	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
A15	3	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B15		-	18	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-
A16	37	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-
B16		-	24	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-
A17	4	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B17		-	17	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-

Edge	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14	J15	J16	J17	J18	J19	J20	J21
A18	36	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-
B18		-	25	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-
A19	5	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B19		-	16	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-
A20	35	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-
B20		-	26	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-
A21	6	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B21		-	15	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-
A22	34	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-
B22		-	27	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-
A23	7	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B23		-	14	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-
A24	33	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-
B24		-	28	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-
A25	8	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B25		-	13	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-
A26	32	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-
B26		-	29	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-	-
A27	9	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B27		-	12	-	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-
A28	31	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-
B28		-	30	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-
A29	10	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B29		-	11	-	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-
A30	30	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
B30		-	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
A31	11	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B31		-	10	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
A32	29	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
B32		-	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
A33	12	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B33		-	9	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
A34	28	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-
B34		-	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-
A35	13	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B35		-	8	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-
A36	27	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-
B36		-	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-
A37	14	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B37		-	7	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-
A38	26	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-
B38		-	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-
A39	15	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B39		-	6	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-
A40	25	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-
B40		-	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-
A41	16	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B41		-	5	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-
A42	24	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-
B42		-	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-
A43	17	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B43		-	4	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-
A44	23	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-
B44		-	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-
A45	18	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B45		-	3	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-
A46	22	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-
B46		-	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-
A47	19	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B47	-	-	2	-	-	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-
A48	-	39	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
B48	-	-	-	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
A49	-	2	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
B49	-	-	-	19	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
A50	-	38	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
B50	-	-	-	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-
A51	-	3	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-
B51	-	-	-	18	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
A52	-	37	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-

Edge	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14	J15	J16	J17	J18	J19	J20	J21
B52	-	-	-	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-
A53	-	4	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
B53	-	-	-	17	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-
A54	-	36	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-
B54	-	-	-	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-
A55	-	5	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-
B55	-		-	16	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-
A56	-	35	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-
B56	-	-	-	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-
A57	-	6	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
B57	-	-	-	15	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-
A58	-	34	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-
B58	-	-	-	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-
A59	-	7	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-
B59	-	-	-	14	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-
A60	-	33	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-
B60	-	-	-	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-
A61	-	8	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
B61	-	-	-	13	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-
A62	-	32	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-	-	-
B62	-	-	-	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-
A63	-	9	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-
B63	-	-	-	12	-	-	-	-	-	-	-	-	-	-	9	-	-	-	-	-
A64	-	31	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-
B64	-	-	-	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-
A65	-	10	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-
B65	-	-	-	11	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-	-
A66	-	30	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
B66	-	-	-	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
A67	-	11	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
B67	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
A68	-	29	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
B68	-	-	-	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
A69	-	12	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-
B69	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
A70	-	28	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
B70	-	-	-	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
A71	-	13	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-
B71	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-
A72	-	27	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-
B72	-	-	-	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
A73	-	14	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-
B73	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-
A74	-	26	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-
B74	-	-	-	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
A75	-	15	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-
B75	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-
A76	-	25	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-
B76	-	-	-	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
A77	-	16	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-
B77	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-
A78	-	24	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-
B78	-	-	-	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
A79	-	17	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-
B79	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-
A80	-	23	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-
B80	-	-	-	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
A81	-	18	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-
B81	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-
A82	-	22	-	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-	-
B82	-	-	-	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9

Table 5: Pins Specific to MTM-RCI-1

MTM Edge Connector Interface

All MTM products are designed with an edge connector interface that requires a compatible PCI connector on carrier PCB. Acroname recommends the through-hole PCI-Express (PCIe) Vertical Connector. The connectors can be combined with an optional retention clip, as shown below. MTM-RCI-1 is designed for the full 164-position connector.

Manufacturer	Manufacturer Part Number	Description
Amphenol FCI Samtec	10018784-10203TLF PCIE-164-02-F-D-TH	PCI-Express 164-position vertical connector
Amphenol FCI	10042618-003LF	PCI-Express Retention Clip (optional)

Table 6: PCI-Express Edge Connectors for MTM Products

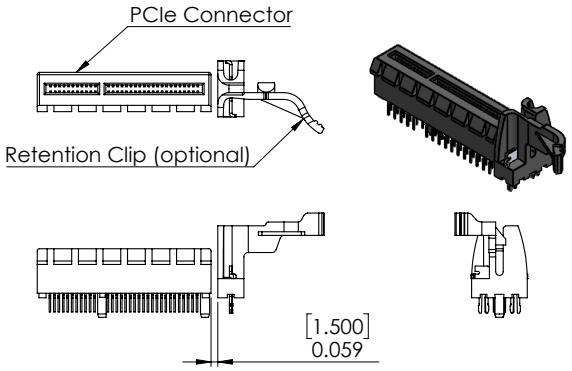

Figure 5: PCIe Vertical Connector with optional Retention Clip

MTM Edge Connector Specifications	Description
Contact Finish	Gold
Card Thickness	0.0625" [1.59mm]
Number of Rows	2
Number of Positions	164
Pitch	0.039" (1.00mm)

Table 7: MTM Edge Connector Specifications for MTM-RCI-1

Breakout Connector Interfaces

Breakouts for the MTM edge connector are available through both 0.1" spaced header connectors and 3.5mm spaced screw terminals. Though specific connectors are not required, Acroname has designed MTM-RCI-1 to accommodate standard 0.1" pitch headers and/or 3.5mm pitch terminals. Suggested connectors include:

2.54mm (0.1") Standard Header Connectors

Manufacturer	Manufacturer Part Number	Description
Amphenol FCI Samtec	65863-085LF TST-120-01-G-D	40-pin 0.1" Shrouded Connector Header

Breakout Connector Specifications	Description
Contact Finish	Gold
Number of Rows	2
Number of Positions	Variable
Pitch	0.1" (2.54mm)

Table 8: Suggested Header Connectors

3.5mm Terminal Connectors

Manufacturer	Manufacturer Part Number	Description
Phoenix Amphenol FCI	1751329 TE10015400J0G	10-pin 3.5mm Screw Terminal

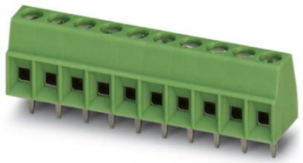

Figure 6: Phoenix Contact 1751329 3.5mm Example Header

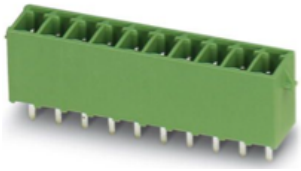

Figure 7: Phoenix Contact 1731565 3.5mm Example Header

Breakout Connector Specifications	Description
Contact Finish	Brass (CuZn)
Number of Rows	1
Number of Positions	Variable
Pitch	0.138" (3.5mm)

Table 9: Suggested Terminal Connectors

Mechanical

Dimensions are shown in mm. 3D CAD models are available through the MTM-RCI-1 product page's Downloads section. A 3D CAD viewer with many different CAD model formats available for download is available at https://a360.co/2zLhgoL

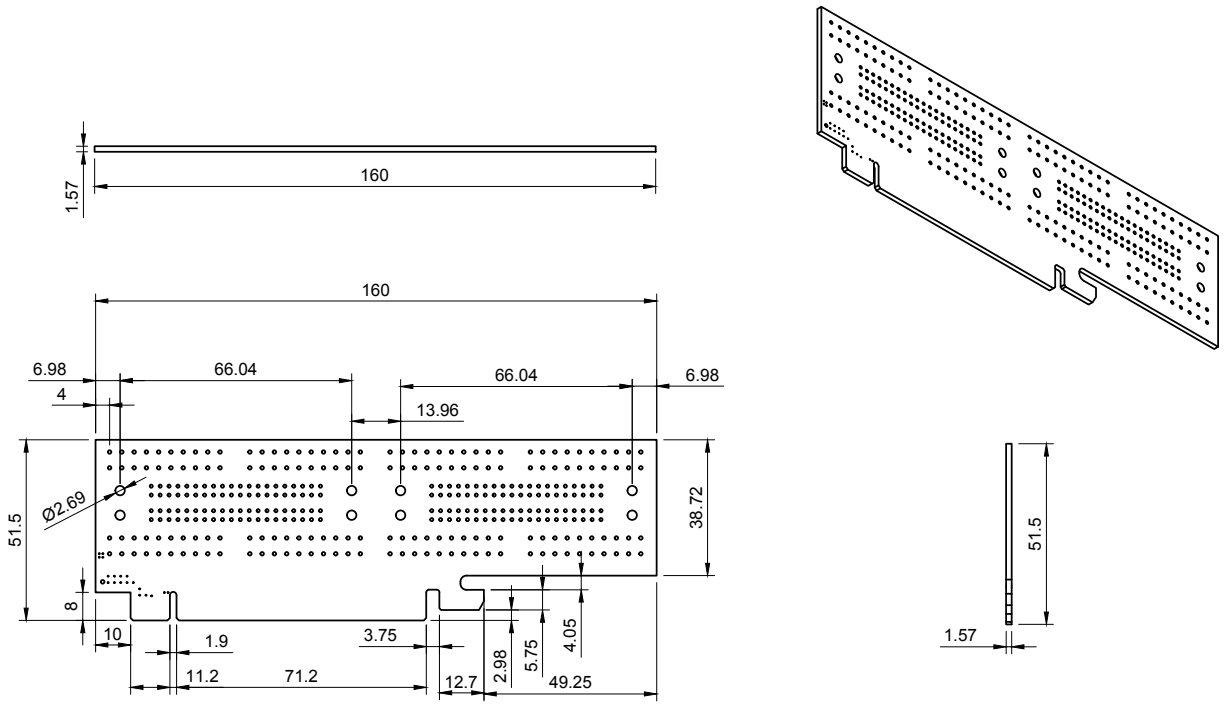

Figure 8: MTM-RCI-1 Mechanical

Product Support

Questions about the product operation or specifications are welcome through Acroname's contact portals. Software downloads, reference API and application examples are available online at:

https://acroname.com/support

Direct communication and additional technical support are available at:

https://acroname.com/contact-us

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Document Revision History

All major documentation changes will be marked with a dated revision code.

Revision	Date	Engineer	Description
1.0	June 2018	LCD	Initial Release
1.1	July 2020	ACRO	Formatting and Fusion 360 updates
1.2	July 2020	ACRO	Figure and table numbers and references.
1.3	February 2021	MJK	Contact information for technical support.

Table 10: Document Revision History