NAMC-EXT-RTM-F
NAMC-EXT-RTM-F-PS
AMC RTM Extender Module
Technical Reference Manual V1.1
HW Revision 1.0

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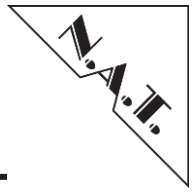

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Conventions

If not otherwise specified, addresses and memory maps are written in hexadecimal notation, identified by 0x.
The following table gives a list of the abbreviations used in this document.

Table 1: List of used abbreviations

Abbreviation	Description
AMC	Advanced Mezzanine Card
BUT	Board Under Test
CLK	Clock
E1	PDH signal – data rate 2.048 Mbit/s
GND	Ground
H.110	Timeslot Interchange Bus
I/O	Input/Output
IPMB	Intelligent Platform Management Bus
LED	Light Emitting Diode
µC	Microcontroller
µTCA/MTCA	Micro Telecommunications Computing Architecture
P2P	Peer-To-Peer
RTM	Rear Transition Module
SMD	Surface Mounted Device
SPI	Serial Peripheral Interface
TCKL	Telecom Clock
TDM	Time Division Multiplex

1 Introduction

The **NAMC-EXT-RTM-F** is a MTCA.4-based extender card for front AMCs, double width, double height. It eases debugging of µTCA-based AMC boards by enabling the user to access the module under test from both sides, install debug port cables, and it allows access for measurement of power supplies.

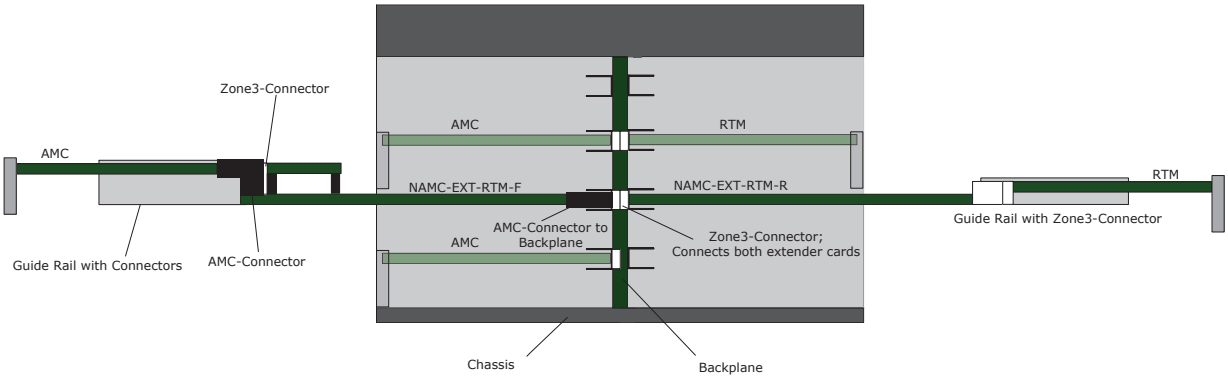
Please note: As an assembly option the board can be equipped with an on-board +3.3V power supply for generating +3.3V Management Power from +12V Payload Power, so the module under test can be operated with an external +12V power supply only (**NAMC-EXT-RTM-F-PS**).
For reasons of simplification this manual refers to the notation **NAMC-EXT-RTM-F** if common functionality is described. If the behaviour differs on the variants, differences are described for each variant separately.

The following figure shows a photo of the **NAMC-EXT-RTM-F**. It is equipped with an AMC- and Zone3-Connector – surrounded by a guide rail – for insertion of the front AMC. Additionally it features two connectors on the rear side; the standard AMC-Connector to connect to the backplane and a Zone3-Connector to connect to a RTM or an **NAMC-EXT-RTM-R** (Extender module for RTM).

Figure 1: NAMC-EXT-RTM-F

Mechanical installation of the **NAMC-EXT-RTM-F** and the **NAMC-EXT-RTM-R** in a chassis is shown in the figure below. Both extender cards connect via the Zone3-Connector.

Figure 2: Mechanical Installation in a Chassis



2 Overview

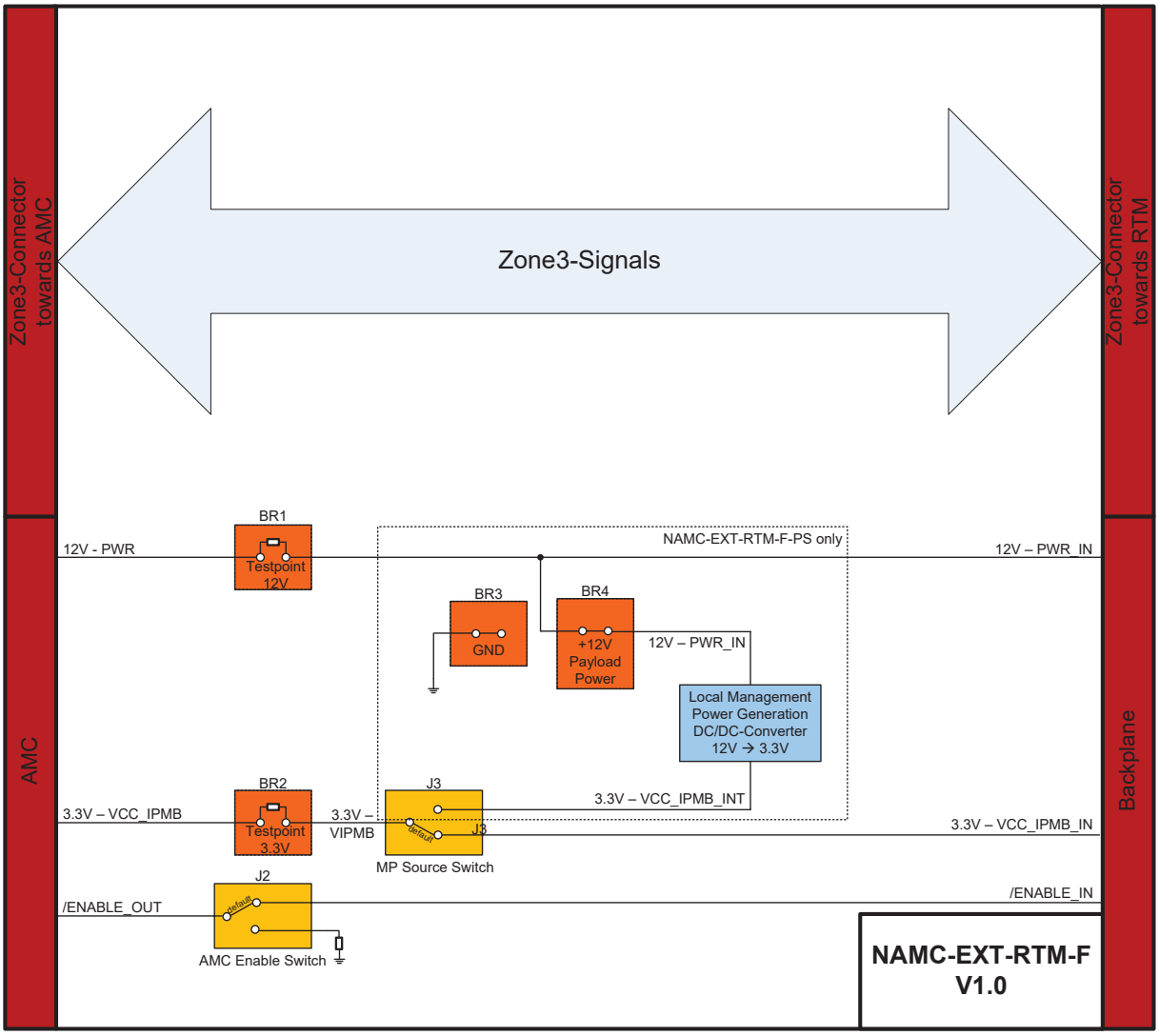
The **NAMC-EXT-RTM-F** consists of a base board and an extension module. The extension module is mandatory to compensate the difference in height between the **NAMC-EXT-RTM-F** base board and the Zone3-Connector to an optional RTM.
Please note: If the extension module is **not** installed, the **NAMC-EXT-RTM-F** can be used with a front AMC **only** as it is **not possible** to connect to an RTM.

The **NAMC-EXT-RTM-F** is a passive extender board, it does not contain any circuitry. The **NAMC-EXT-RTM-F-PS** features an on-board +3.3V power supply for generating Management Power from Payload Power, so the module under test can be operated with an external +12V power supply only.

2.1 Block Diagram

The following figure shows a block diagram of the **NAMC-EXT-RTM-F-PS** with the optional power supply.

Figure 3: NAMC-EXT-RTM-F – Block Diagram



2.2 Location Diagrams

The following figures highlight the position of the important components. Depending on the board type it might be that the board does not include all components named in the location diagrams. This applies in particular to the optional +3.3V power supply of the **NAMC-EXT-RTM-F-PS**.

Figure 4: NAMC-EXT-RTM-F – Location Diagram (AMC part; top left side)

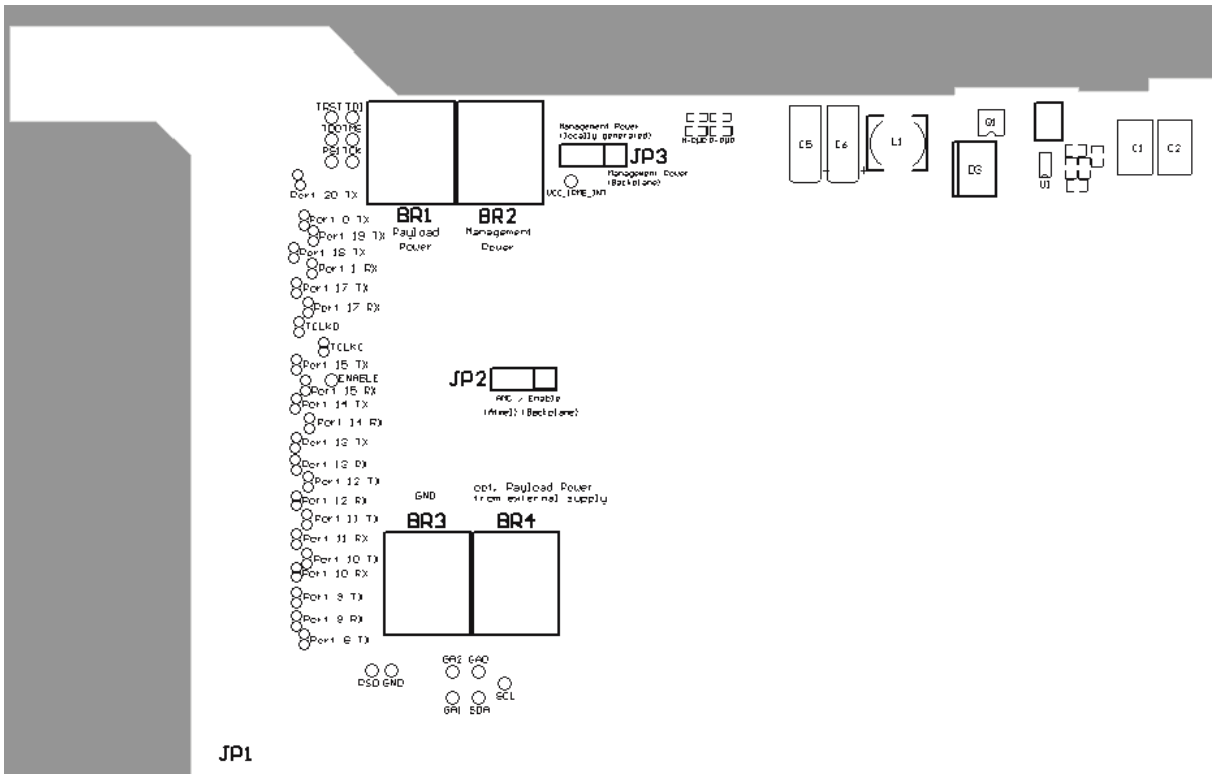


Figure 5: NAMC-EXT-RTM-F – Location Diagram (AMC part; bottom left side)

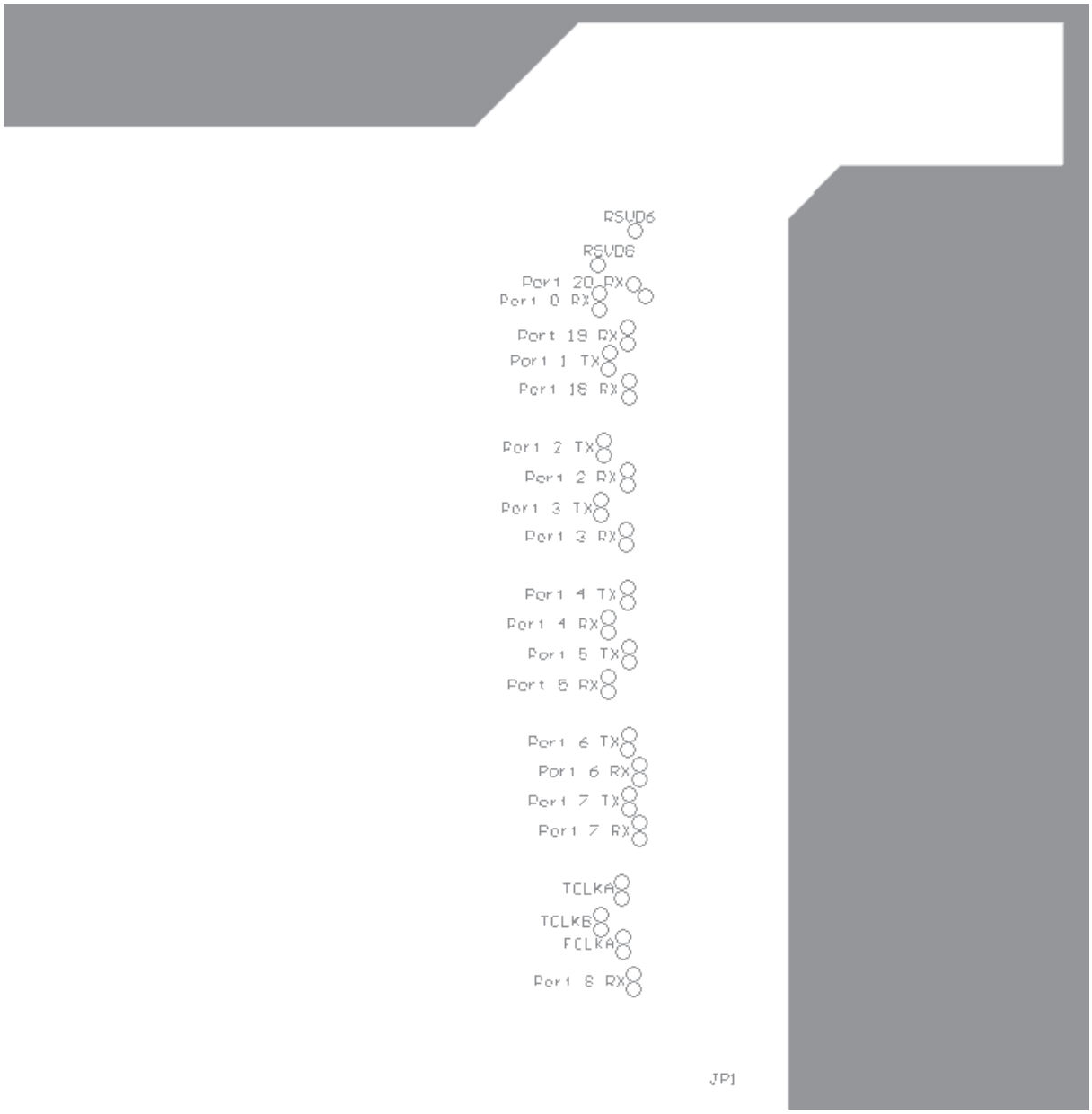


Figure 6: NAMC-EXT-RTM-F – Location Diagram (RTM part; bottom left side)

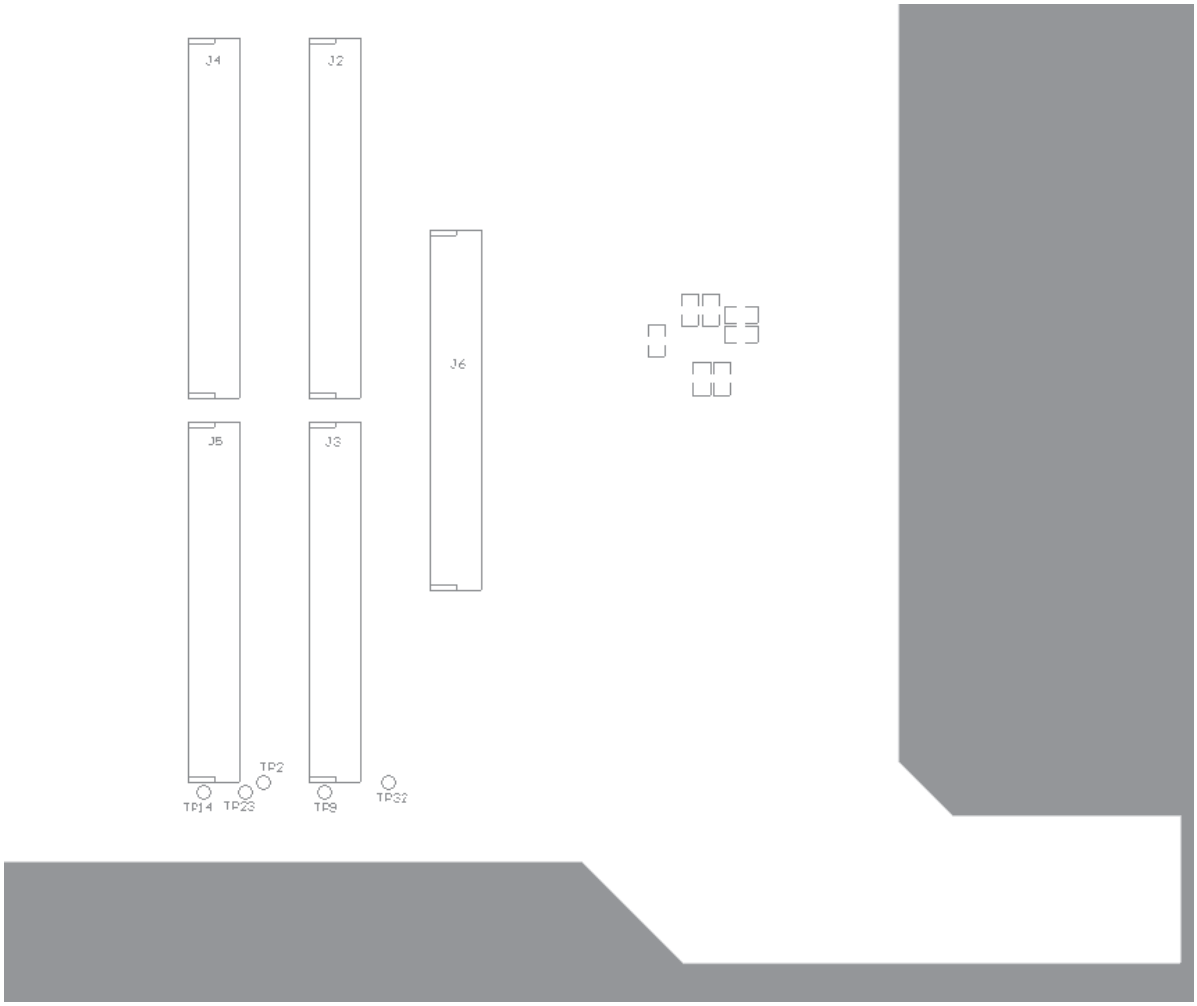


Figure 7: NAMC-EXT-RTM-F – Location Diagram (RTM part; top left side)

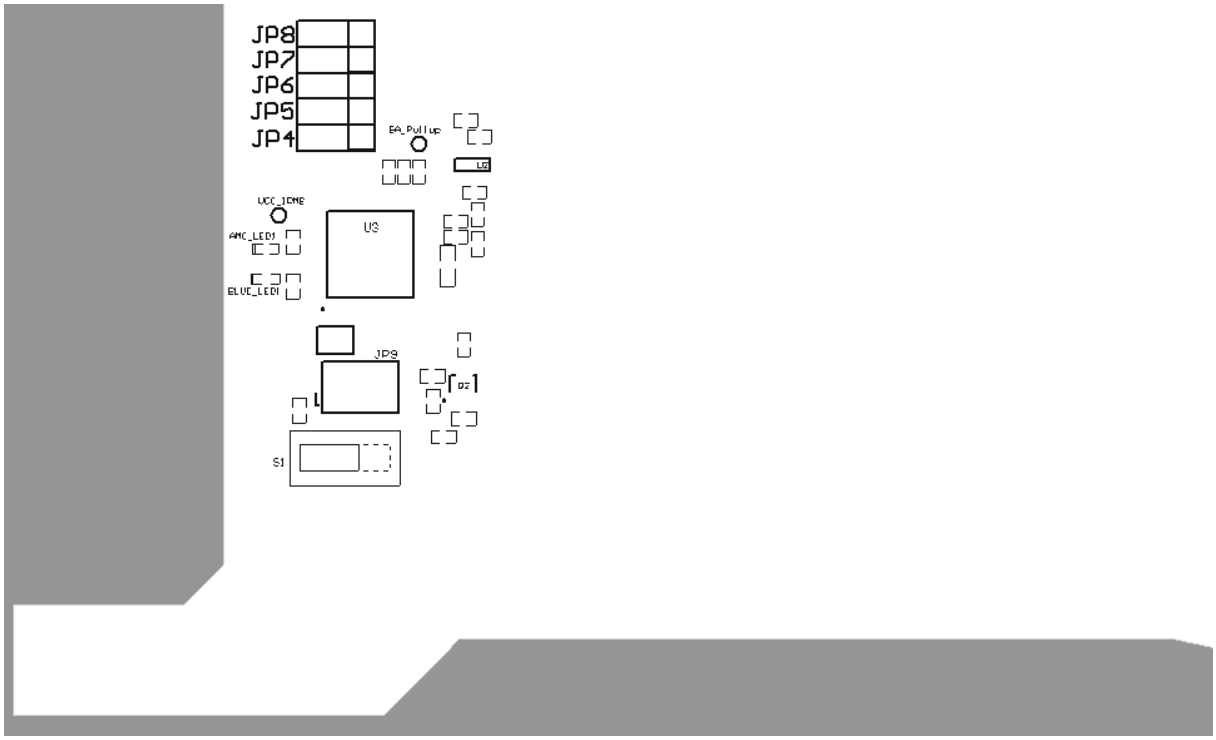


Figure 8: NAMC-EXT-RTM-F (ext. board) – Location D. (RTM part; bottom side)

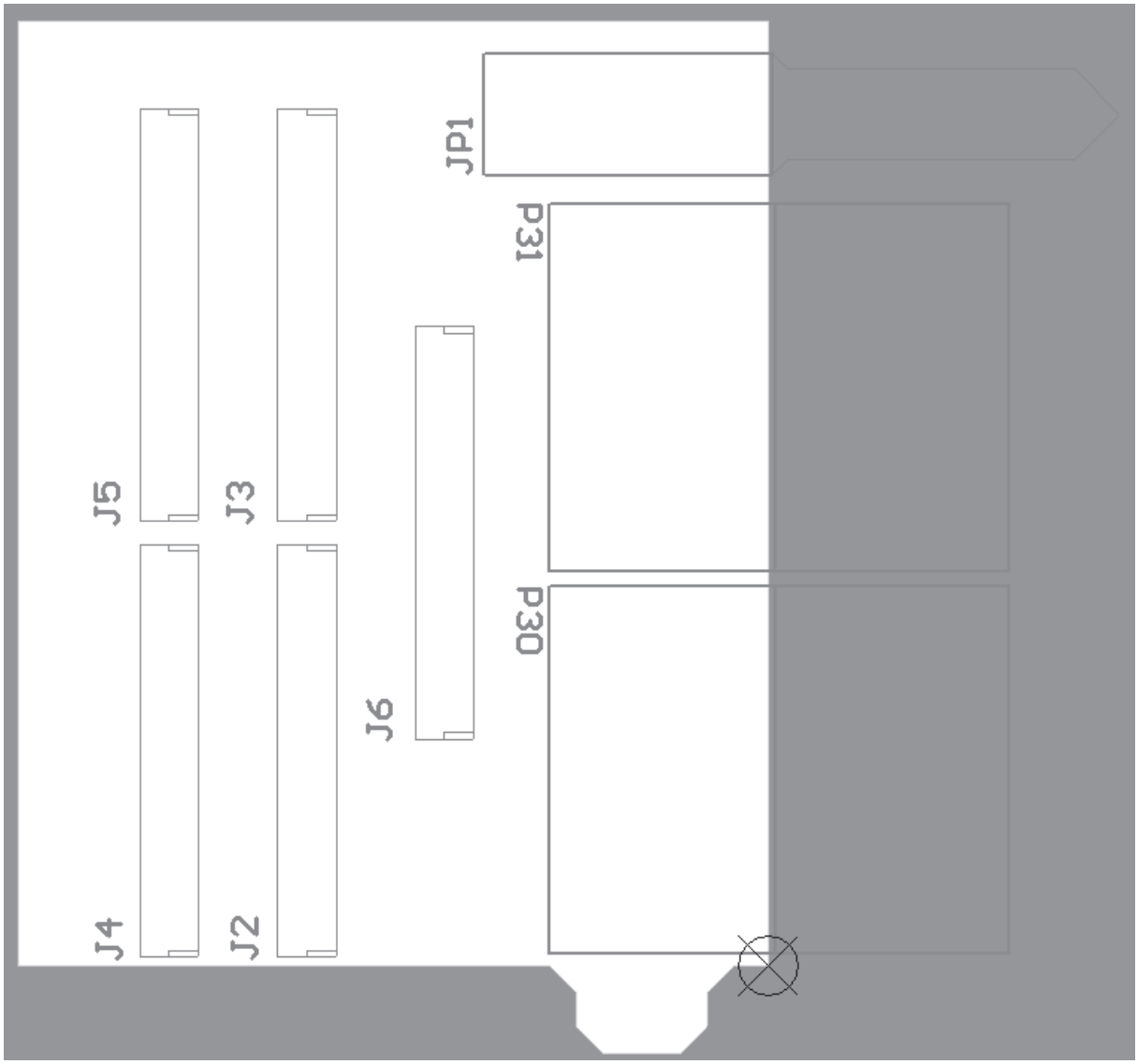
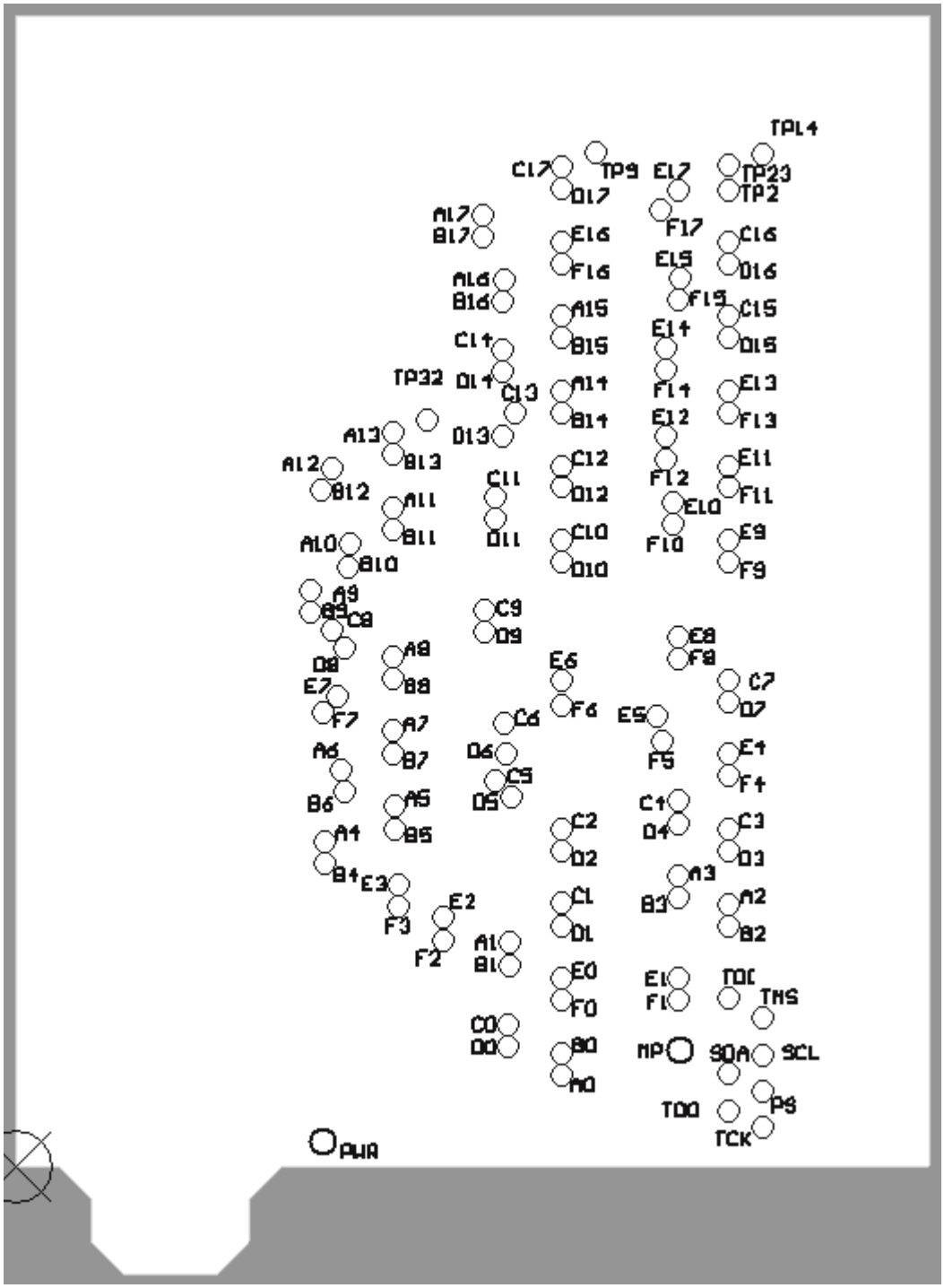


Figure 9: NAMC-EXT-RTM-F (ext. board) – Location D. (RTM part; top side)



3 Board Features

3.1 Bus Interface

- All AMC ports connected
- All RTM ports connected

3.2 Power Supply

- The **NAMC-EXT-RTM-F** draws very little power from the carrier supplies. Current drawn from +3.3V and +12V is less than 10mA each.
- Power planes for GND, payload power and management power.
- Both power supplies drive signalling LEDs.
- Both power supplies may be cut by opening wire bridges for current measurements.
- On the **NAMC-EXT-RTM-F-PS** +3.3V Management power may either be taken from the backplane or generated locally from Payload Power (assembly option).
- Payload Power may either be taken from the backplane or a +12V power supply may be connected to wire bridge BR4.

4 Hardware

4.1 AMC Port Definition

Table 2: AMC Port Definition for N.A.T. AMC Modules

	Port #	AMC Port Mapping Strategy	Port used as
Basic Connector	CLK1	Clocks	Universal Clock Signal, depends on used AMC
	CLK2		Universal Clock Signal, depends on used AMC
	CLK3		Universal Clock Signal, depends on used AMC
	0	Common Options Region	Not specified, depends on used AMC
	1		Not specified, depends on used AMC
	2		Not specified, depends on used AMC
	3		Not specified, depends on used AMC
	4	Fat Pipes	Not specified, depends on used AMC
	5		Not specified, depends on used AMC
	6		Not specified, depends on used AMC
	7		Not specified, depends on used AMC
Extended Connector	8	Region	Not specified, depends on used AMC
	9		Not specified, depends on used AMC
	10		Not specified, depends on used AMC
	11		Not specified, depends on used AMC
	12	Extended Options Region	Not specified, depends on used AMC
	13		Not specified, depends on used AMC
	14		Not specified, depends on used AMC
	15		Not specified, depends on used AMC
	16		TCLKC / TCLKD
	17		Not specified, depends on used AMC
	18		Not specified, depends on used AMC
	19		Not specified, depends on used AMC
	20		Not specified, depends on used AMC

4.2 Connectors, Jumpers and Wire Bridges

There are several connectors and wire bridges on the **NAMC-EXT-RTM-F** board. Connector J1 is a direct connector and fits into the μTCA AMC slot. Connector JP1, P30 and P31 are the socket into which the device under test is plugged. J30 and J31 enable the connection to an RTM. The following figure shows the connectors, as well as the wire bridges:

Figure 10: NAMC-EXT-RTM-F (base board) – Connectors

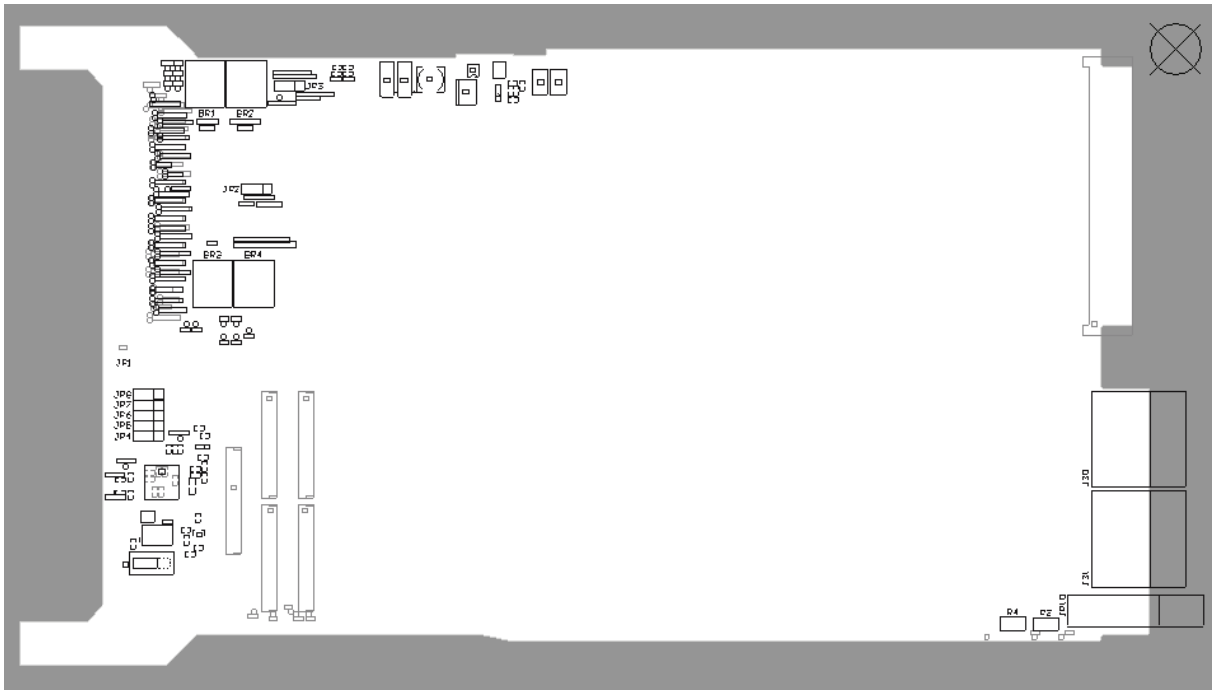
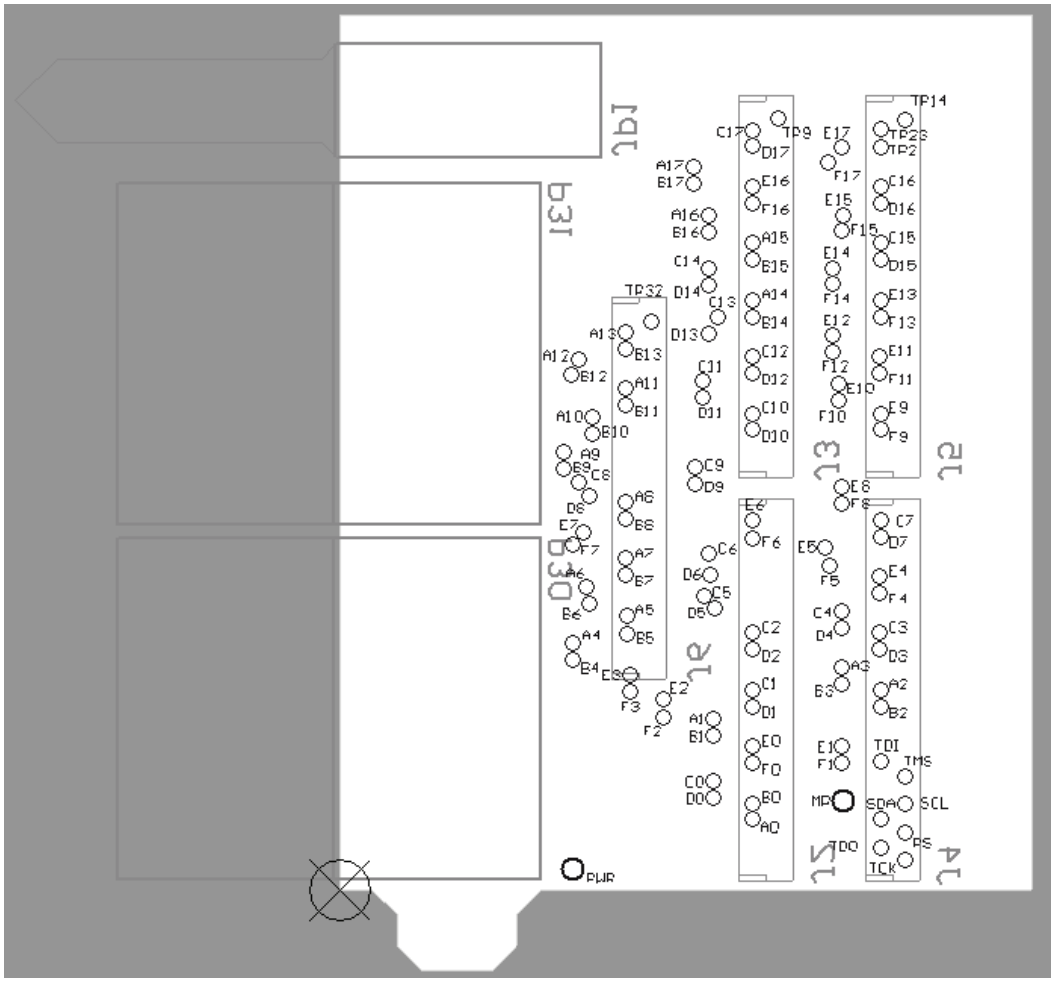


Figure 11: NAMC-EXT-RTM-F (extension board) – Connectors



4.2.1 J1/JP1: AMC Connectors

Table 3: J1/JP1: AMC Connectors – Pin Assignment

Pin #	AMC-Signal	AMC-Signal	Pin #
1	GND	GND	170
2	PWR	TDI	169
3	/PS1	TDO	168
4	PWR_IPMB	/TRST	167
5	GA0	TMS	166
6	RESVD	TCK	165
7	GND	GND	164
8	RESVD	Tx20+	163
9	PWR	Tx20-	162
10	GND	GND	161
11	Tx0+	Rx20+	160
12	Tx0-	Rx20-	159
13	GND	GND	158
14	Rx0+	Tx19+	157
15	Rx0-	Tx19-	156
16	GND	GND	155
17	GA1	Rx19+	154
18	PWR	Rx19-	153
19	GND	GND	152
20	Tx1+	Tx18+	151
21	Tx1-	Tx18-	150
22	GND	GND	149
23	RLINK2_P	Rx18+	148
24	RLINK2_N	Rx18-	147
25	GND	GND	146
26	GA2	Tx17+	145
27	PWR	Tx17-	144
28	GND	GND	143
29	Tx2+	Rx17+	142
30	Tx2-	Rx17-	141
31	GND	GND	140
32	Rx2+	Tx16+	139
33	Rx2-	Tx16-	138
34	GND	GND	137
35	Tx3+	Rx16+	136
36	Tx3-	Rx16-	135
37	GND	GND	134
38	Rx3+	Tx15+	133
39	Rx3-	Tx15-	132
40	GND	GND	131
41	/ENABLE	Rx15+	130
42	PWR	Rx15-	129
43	GND	GND	128
44	Tx4+	Tx14+	127
45	Tx4-	Tx14-	126
46	GND	GND	125

Pin #	AMC-Signal	AMC-Signal	Pin #
47	Rx4+	Rx14+	124
48	Rx4-	Rx14-	123
49	GND	GND	122
50	Tx5+	Tx13+	121
51	Tx5-	Tx13-	120
52	GND	GND	119
53	Rx5+	Rx13+	118
54	Rx5-	Rx13-	117
55	GND	GND	116
56	IPMB_SCL	Tx12+	115
57	PWR	Tx12-	114
58	GND	GND	113
59	Tx6+	Rx12+	112
60	Tx6-	Rx12-	111
61	GND	GND	110
62	Rx6+	Tx11+	109
63	Rx6-	Tx11-	108
64	GND	GND	107
65	Tx7+	Rx11+	106
66	Tx7-	Rx11-	105
67	GND	GND	104
68	Rx7+	Tx10+	103
69	Rx7-	Tx10-	102
70	GND	GND	101
71	IPMB_SDA	Rx10+	100
72	PWR	Rx10-	99
73	GND	GND	98
74	TCLKA+	Tx9+	97
75	TCLKA-	Tx9-	96
76	GND	GND	95
77	TCLKB+	Rx9+	94
78	TCLKB-	Rx9-	93
79	GND	GND	92
80	FCLKA+	Tx8+	91
81	FCLKA-	Tx8-	90
82	GND	GND	89
83	/PS0	Rx8+	88
84	PWR	Rx8-	87
85	GND	GND	86

4.2.2 Connector J2, J3, J4, J5 and J6

Connector J2, J3, J4, J5 and J6 connect the **NAMC-EXT-RTM-F** base board and the **NAMC-EXT-RTM-F** extension board.

Table 4: Connector J2 – Pin Assignment

Pin #	RTM-Signal	RTM-Signal	Pin #
1	RTM_PWR	RTM_PWR	26
2	RTM_PWR	RTM_PWR	27
3	GND	GND	28
4	GND	A0	29
5	GND	B0	30
6	D0	GND	31
7	C0	GND	32
8	GND	F0	33
9	GND	E0	34
10	B1	GND	35
11	A1	GND	36
12	GND	D1	37
13	GND	C1	38
14	F2	GND	39
15	E2	GND	40
16	GND	D2	41
17	GND	C2	42
18	F3	GND	43
19	E3	GND	44
20	GND	D5	45
21	GND	C5	46
22	D6	GND	47
23	C6	GND	48
24	GND	F6	49
25	GND	E6	50

Table 5: Connector J3 – Pin Assignment

Pin #	RTM-Signal	RTM-Signal	Pin #
1	D9	GND	26
2	C9	GND	27
3	GND	D10	28
4	GND	C10	29
5	D11	GND	30
6	C11	GND	31
7	GND	D12	32
8	GND	C12	33
9	D13	GND	34
10	C13	GND	35
11	GND	B14	36
12	GND	A14	37
13	D14	GND	38
14	C14	GND	39
15	GND	B15	40
16	GND	A15	41

Pin #	RTM-Signal	RTM-Signal	Pin #
17	B16	GND	42
18	A16	GND	43
19	GND	F16	44
20	GND	E16	45
21	B17	GND	46
22	A17	GND	47
23	GND	D17	48
24	GND	C17	49
25	TP9	GND	50

Table 6: Connector J4 – Pin Assignment

Pin #	RTM-Signal	RTM-Signal	Pin #
1	RTM_TCK	GND	26
2	GND	RTM_TDO	27
3	RTM_PS	GND	28
4	GND	RTM_SDA	29
5	RTM_SCL	GND	30
6	GND	RTM_MP	31
7	RTM_TMS	GND	32
8	GND	RTM_TDI	33
9	GND	GND	34
10	F1	GND	35
11	E1	GND	36
12	GND	B2	37
13	GND	A2	38
14	B3	GND	39
15	A3	GND	40
16	GND	D3	41
17	GND	C3	42
18	D4	GND	43
19	C4	GND	44
20	GND	F4	45
21	GND	E4	46
22	F5	GND	47
23	E5	GND	48
24	GND	D7	49
25	GND	C7	50

Table 7: Connector J5 – Pin Assignment

Pin #	RTM-Signal	RTM-Signal	Pin #
1	F8	GND	26
2	E8	GND	27
3	GND	F9	28
4	GND	E9	29
5	F10	GND	30
6	E10	GND	31
7	GND	F11	32
8	GND	E11	33
9	F12	GND	34
10	E12	GND	35

Pin #	RTM-Signal	RTM-Signal	Pin #
11	GND	F13	36
12	GND	E13	37
13	F14	GND	38
14	E14	GND	39
15	GND	D15	40
16	GND	C15	41
17	F15	GND	42
18	E15	GND	43
19	GND	D16	44
20	GND	C16	45
21	F17	GND	46
22	E17	GND	47
23	GND	TP2	48
24	GND	TP23	49
25	TP14	GND	50

Table 8: Connector J6 – Pin Assignment

Pin #	RTM-Signal	RTM-Signal	Pin #
1	B4	GND	26
2	A4	GND	26
3	GND	B5	28
4	GND	A5	29
5	B6	GND	30
6	A6	GND	31
7	GND	B7	32
8	GND	A7	33
9	F7	GND	34
10	E7	GND	35
11	GND	B8	36
12	GND	A8	37
13	D8	GND	38
14	C8	GND	39
15	GND	B9	40
16	GND	A9	41
17	B10	GND	42
18	A10	GND	43
19	GND	B11	44
20	GND	A11	45
21	B12	GND	46
22	A12	GND	47
23	GND	B13	48
24	GND	A13	49
25	TP32	GND	50

4.2.3 Jumper JP2

The setting of jumper JP2 defines the source for /AMC_ENABLE signal. The default position (right aligned) means the signal is connected to the backplane (Pin No. 1 connected to Pin No. 2). In the left aligned position the signal is pulled down locally on the extender board (Pin No. 2 connected to Pin No. 3). This position also enables the local Management Controller (ATmega16L-8AC).

Table 9: Jumper JP2 – Pin Assignment

Pin #	Signal
1	/Enable_IN
2	/Enable_OUT
3	/Enable_AT

4.2.4 Jumper JP3

The setting of jumper JP3 defines the source of Management Power. By default, Management Power is taken from the backplane (right aligned position). In case there is no Management Power available (e.g. a test assembly with just a +12V supply), Management Power can be generated on-board from the +12V Payload Power. In order to make use of this feature, set jumper JP3 to the left aligned position.

Table 10: Jumper JP3 – Pin Assignment

Pin #	Signal
1	VCC_IPMB_IN
2	VCC_IPMB
3	VCC_IPMB_INT

Please note: The function of Jumper JP3 is only valid on the **NAMC-EXT-RTM-F--PS**.

4.2.5 Jumper JP4 and JP5

The settings of jumper JP4 and JP5 define the utilization of a local (on the **NAMC-EXT-RTM-F**) and non-local (on AMC board) Management Controller. By default, the nonlocal Management Controller is used (Pin 1 to Pin 3 are connected).

Table 11: Jumper JP4 – Pin Assignment

Pin #	Signal
1	SDA_IN
2	SDA_AT
3	SDA_OUT

Table 12: Jumper JP5 – Pin Assignment

Pin #	Signal
1	SCL_IN
2	SCL_AT
3	SCL_OUT

4.2.6 Jumper JP6, JP7 and JP8

The settings of jumper JP6, JP7 and JP8 define the geographical address of the module on IPMB. By default, it defines the address of the non-local Management Controller (Pin 1 to Pin 3 are connected).

Table 13: Jumper JP6 – Pin Assignment

Pin #	Signal
1	GA0_IN
2	GA0_AT
3	GA0_OUT

Table 14: Jumper JP7 – Pin Assignment

Pin #	Signal
1	GA1_IN
2	GA1_AT
3	GA1_OUT

Table 15: Jumper JP8 – Pin Assignment

Pin #	Signal
1	GA2_IN
2	GA2_AT
3	GA2_OUT

4.2.7 JP9: Atmel Programming Port

Connector JP9 connects to the programming-port of the Atmel µC device.

Table 16: JP9: Atmel Programming Port – Pin Assignment

Pin #	Signal
1	MISO
2	VCC_IPMB
3	SCK
4	MOSI
5	/RST_IMPI
6	GND

4.2.8 J30/P30: RTM Connector

Table 17: J30/P30: RTM Connector – Pin Assignment

Pin #	RTM-Signal	RTM-Signal	Pin #
1	RTM_PWR	C3	46
2	RTM_PWR	D3	47
3	GND	GND	48
4	RTM_PWR	C4	49
5	RTM_PWR	D4	50
6	GND	GND	51
7	A0	C5	52
8	B0	D5	53
9	GND	GND	54
10	A1	C6	55
11	B1	D6	56
12	GND	GND	57
13	A2	C7	58
14	B2	D7	59
15	GND	GND	60
16	A3	RTM_TCK	61
17	B3	RTM_TDO	62
18	GND	GND	63
19	A4	RTM_TDI	64
20	B4	RTM_TMS	65
21	GND	GND	66
22	A5	E0	67
23	B5	F0	68
24	GND	GND	69
25	A6	E1	70
26	B6	F1	71
27	GND	GND	72
28	A7	E2	73
29	B7	F2	74
30	GND	GND	75
31	RTM_PS	E3	76
32	RTM_SDA	F3	77
33	GND	GND	78
34	RTM_MP	E4	79
35	RTM_SCL	F4	80
36	GND	GND	81
37	C0	E5	82
38	D0	F5	83
39	GND	GND	84
40	C1	E6	85
41	D1	F6	86
42	GND	GND	87
43	C2	E7	88
44	D2	F7	89
45	GND	GND	90

4.2.9 J31/P31: RTM Connector

Table 18: J31/P31: RTM Connector – Pin Assignment

Pin #	RTM-Signal	RTM-Signal	Pin #
1	A8	C13	46
2	B8	D13	47
3	GND	GND	48
4	A9	C14	49
5	B9	D14	50
6	GND	GND	51
7	A10	C15	52
8	B10	D15	53
9	GND	GND	54
10	A11	C16	55
11	B11	D16	56
12	GND	GND	57
13	A12	C17	58
14	B12	D17	59
15	GND	GND	60
16	A13	E8	61
17	B13	F8	62
18	GND	GND	63
19	A14	E9	64
20	B14	F9	65
21	GND	GND	66
22	A15	E10	67
23	B15	F10	68
24	GND	GND	69
25	A16	E11	70
26	B16	F11	71
27	GND	GND	72
28	A17	E12	73
29	B17	F12	74
30	GND	GND	75
31	C8	E13	76
32	D8	F13	77
33	GND	GND	78
34	C9	E14	79
35	D9	F14	80
36	GND	GND	81
37	C10	E15	82
38	D10	F15	83
39	GND	GND	84
40	C11	E16	85
41	D11	F16	86
42	GND	GND	87
43	C12	E17	88
44	D12	F17	89
45	GND	GND	90

4.2.10 Wire Bridges

The wire bridges BR1 and BR2 connect the supply voltages. The supply current can be measured between both contacts of one bridge if the respective wire bridge is opened.
Please note: Instead of using a simple ampere meter it is recommended to insert a shunt resistor (e.g. 10 mΩ) between the contacts and measure the voltage drop to calculate the current or to monitor it on an oscilloscope.

Both contacts of BR3 are connected to ground; it can be used as a reference contact for measuring and/or to connect an external power supply (**NAMC-EXT-RTM-PS** only).

Both contacts of BR4 are connected to +12V Payload Power; it can be used to connect an external power supply to the extender board (**NAMC-EXT-RTM-PS** only).

The following table gives an overview of the wire bridges and the supplies they connect.

Table 19: Wire Bridges

Supply	Wire Bridge
+12V Payload Power	BR1
+3.3V Management Power	BR2
GND (reference point or external supply)	BR3
+12V Payload Power (external supply)	BR4

4.3 Test points

There are a number of test points available on the **NAMC-EXT-RTM-F**. Due to layout reasons there are only small SMD test points for the differential signals. All other signals (e.g. geographical address, IPMB signals, etc.) are routed to standard test points, into which standard 100 mil header connectors may be assembled. By default, there are no headers assembled. The names of the signals carried by the test points are printed on the silkscreen.

5 Board Specifications

Table 20: NAMC-EXT-RTM-F: Board Specifications

AMC-Module	Extender for Standard Advanced Mezzanine Cards, double width, double height
Power Consumption (NAMC-EXT-RTM-F only)	+3.3V / 0.01A typical +12V / 0.01A typical
Operating Temperature	-40°C - +85°C
Storage Temperature	-40°C - +85°C
Humidity	5% – 90% rh non-condensing

6 Installation

6.1 Safety Note

To ensure proper functioning of the **NAMC-EXT-RTM-F** during its usual lifetime take the following precautions before handling the board.

CAUTION
Electrostatic discharge and incorrect board installation and uninstallation can damage circuits or shorten their lifetime.

- Before installing or uninstalling the **NAMC-EXT-RTM-F** read this installation section
- Before installing or uninstalling the **NAMC-EXT-RTM-F** in a rack:
  - Check all installed boards and modules for steps that you have to take before turning on or off the power.
  - Take those steps.
  - Finally turn on or off the power.
- Before touching integrated circuits ensure to take all require precautions for handling electrostatic devices.

6.2 Installation Requirements

IMPORTANT
Before powering up check this section for installation prerequisites and requirements!

6.2.1 Requirements

The installation requires only

- an AMC backplane for connecting the **NAMC-EXT-RTM-F.**
- a power supply

6.2.2 Power supply

The power supply for the **NAMC-EXT-RTM-F** must meet the following specifications:

- required for the extender board:
  - +3.3V / 0.01A typical
  - +12V / 0.01A typical
- required for the board under test:
  - refer to the BUT power specification

6.3 Statement on Environmental Protection

6.3.1 Compliance to RoHS Directive

Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the "Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment" (RoHS) predicts that all electrical and electronic equipment being put on the European market after June 30th, 2006 must contain lead, mercury, hexavalent chromium, polybrominated biphenyls (PBB) and poly-brominated diphenyl ethers (PBDE) and cadmium in maximum concentration values of 0.1% respective 0.01% by weight in homogenous materials only.

As these hazardous substances are currently used with semiconductors, plastics (i.e. semiconductor packages, connectors) and soldering tin any hardware product is affected by the RoHS directive if it does not belong to one of the groups of products exempted from the RoHS directive.

Although many of hardware products of N.A.T. are exempted from the RoHS directive it is a declared policy of N.A.T. to provide all products fully compliant to the RoHS directive as soon as possible. For this purpose since January 31st, 2005 N.A.T. is requesting RoHS compliant deliveries from its suppliers. Special attention and care has been payed to the production cycle, so that wherever and whenever possible RoHS components are used with N.A.T. hardware products already.

6.3.2 Compliance to WEEE Directive

Directive 2002/95/EC of the European Commission on "Waste Electrical and Electronic Equipment" (WEEE) predicts that every manufacturer of electrical and electronical equipment which is put on the European market has to contribute to the reuse, recycling and other forms of recovery of such waste so as to reduce disposal. Moreover this directive refers to the Directive 2002/95/EC of the European Comission on the "Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment" (RoHS).

Having its main focus on private persons and households using such electrical and electronic equipment the directive also affects business-to-business relationships. The directive is quite restrictive on how such waste of private persons and households has to be handled by the supplier/manufacturer, however, it allows a greater flexibility in business-to-business relationships. This pays tribute to the fact with industrial use electrical and electronical products are commonly integrated into larger and more complex environments or systems that cannot easily be split up again when it comes to their disposal at the end of their life cycles.

As N.A.T. products are solely sold to industrial customers, by special arrangement at time of purchase the customer agreed to take the responsibility for a WEEE compliant disposal of the used N.A.T. product. Moreover, all N.A.T. products are marked according to the directive with a crossed out bin to indicate that these products within the European Community must not be disposed with regular waste.

If you have any questions on the policy of N.A.T. regarding the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the "Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment" (RoHS) or the Directive 2002/95/EC of the European Commission on "Waste Electrical and Electronic Equipment" (WEEE) please contact N.A.T. by phone or e-mail.

6.3.3 Compliance to CE Directive

Compliance to the CE Directive is declared. A 'CE' sign can be found on the PCB.

6.3.4 Product Safety

The board complies to EN60950 and UL1950.

6.3.5 Compliance to REACH

The REACH EU regulation (Regulation (EC) No 1907/2006) is known to N.A.T. GmbH. N.A.T. did not receive information from their European suppliers of substances of very high concern of the ECHA candidate list. Article 7(2) of REACH is notable as no substances are intentionally being released by NAT products and as no hazardous substances are contained. Information remains in effect or will be otherwise stated immediately to our customers.

7 Known Bugs / Restrictions

none

Appendix A: Document's History

Revision	Date	Description	Author
1.0	01.07.2010	initial revision	rm
1.1	17.05.2013	Adresse, phone and fax updated, words updated ,	fh
	19.08.2014	Adaption to new layout incl. renaming of headings Minor changes, typo correction Updated chapter 6.3 RoHS-Directive / REACH	se
	25.08.2014	Added **–PS** option Added installation drawing	Se
	22.09.2014	Added Block Diagram Reworked Chapter 4.2.10	se