VadaTech AMC21x (x = 6, 7, 8, 9)

AMC Multiport Managed Layer 2 Switch Modules

Product Reference Guide

October 2016
Version 1.0

Revision History

Doc Revision	Description of Change	Revision Date
1.0	Initial release	October 2016

Table of Contents

Figures

Tables

1 Introduction

1.1 Purpose

This document describes AMC21x series of VadaTech Multiport Managed Layer 2 Gigabit Ethernet Switch AMC modules.

1.2 Applicable Products

- AMC216
- AMC217
- AMC218
- AMC219

1.3 Document References

1.3.1 Specifications

The AMC21x is compliant with the following specifications:

- *PICMG® AMC.0 R2.0 Advanced Mezzanine Card Base Specification*
- *PICMG® AMC.1 R2.0 Advanced Mezzanine Card PCIe Specification*
- *PICMG® AMC.2 R1.0 Advanced Mezzanine Card PCIe Specification*

1.3.2 Related Documents

The following documents provide information related to AMC21x:

- *AMC21(6-9) Datasheet*
- *VadaTech Gigabit Ethernet Managed Switch Setup*
- *VadaTech Gigabit Ethernet Switch Web Interface Reference Manual*

1.4 Acronyms Used in this Document

Table 1: Acronyms

Acronym	Description
AMC	Advanced Mezzanine Card
CPU	Central Processing Unit
DIP	Dual In-line Package
GbE	Gigabit Ethernet
GND	Ground
IPMB	Intelligent Platform Management Bus

Acronym	Description
IPMI	Intelligent Platform Management Interface
LED	Light Emitting Diode
MicroTCA or μTCA	Micro Telecommunications Computing Architecture
MMC	Module Management Controller
PCIe	Peripheral Component Interconnect Express
PICMG	PCI Industrial Computer Manufacturers Group

1.5 Conventions Used

The following conventions are used in this document:

Important information, when ignored can cause serious damage to the user or the device is described using this symbol

2 AMC21x Overview

2.1 Hardware Overview

The AMC21x is a series of multiport Managed Layer 2 Switch AdvancedMC™ (AMC) modules. VadaTech offers these modules in a single module, mid/full size form factor based on the AMC.2 specification. The AMC21x modules are based on the Broadcom BCM53726 integrated multiport switch.

The comparison of AMC21x series AMCs is provided in Table 2.

Table 2: AMC Module Comparison

Features	AMC216	AMC217	AMC218	AMC219
Dimensions	Single module, full-size	Single module, full-size	Single module, mid-size(full-size optional)	Single module, mid-size(full-size optional)
Specifications	AMC.0 and AMC.2	AMC.0 and AMC.2	AMC.0 and AMC.2	AMC.0 and AMC.2
Front Ethernet ports	Eight 10/100/1000 Mbit ports via SFP connectors	Eight 10/100/1000 Mbit ports via RJ-45 connectors	Six 10/100/1000 Mbit ports via MRJ-21 connector	Twelve 10/100 ports via MRJ-21 connector
AMC ports	Ports 0 and 1	Ports 0 and 1	Ports 0 and 1	Ports 0 and 1
RS-232	On board header access to IPMI, front panel access to Switch via Micro USB	On board header access to IPMI and front panel access to Switch via Micro USB	Front panel access to Switch and IPMI	Front panel access to Switch and IPMI
Power consumption	7 W	8 W	7 W	7 W

2.1.1 Custom Options

You can customize the AMC21x modules to meet your specific requirements, refer to the Datasheet for your device's ordering options.

2.2 Software Overview

The AMC21x products have a Managed Layer 2 switch. Refer to the following documents for more information on configuring and managing the Gigabit Ethernet Switches.

- *VadaTech Gigabit Ethernet Managed Switch Setup*
- *VadaTech Gigabit Ethernet Switch Web Interface Reference Manual*

2.3 Architecture

The AMC21x series utilizes Broadcom BCM53726 device that combines the functions of a high-speed switch system, including packet buffers, SerDes, media access controllers, address management, a non-blocking switch fabric, and integrated high-performance CPU. The BCM53726 series supports auto-DoS attack prevention, SNMP, IEEE 802.1x, spanning tree, and rapid spanning tree protocols.

Summary of BCM53726 features are:

- Up to 16-ports, 10/100/1000-Mbps Ethernet switch device
- Integrated MACs (IEEE 802.x compliant) with support for 9216-byte jumbo frames
- Non-blocking Gigabit Ethernet fully integrated switch fabric with 512-KB packet buffer memory
- Packet classification using four IEEE 802.1p quality of service (QoS) or DiffServ/TOS priority queues
- Supports 4K IEEE 802.1Q VLAN
- Supports up to 8K unicast MAC addresses
- Supports MAC-based port aggregation (trunking)
- Supports access control list (ACL) host table
- Full- (IEEE 802.3x) and half-duplex flow control
- Supports automatic address learning and aging
- Supports spanning tree and rapid spanning tree protocols
- Supports IEEE 802.1x MAC security
- Port-based rate control with 1-Mbps granularity

Figure 1: Functional Block Diagram

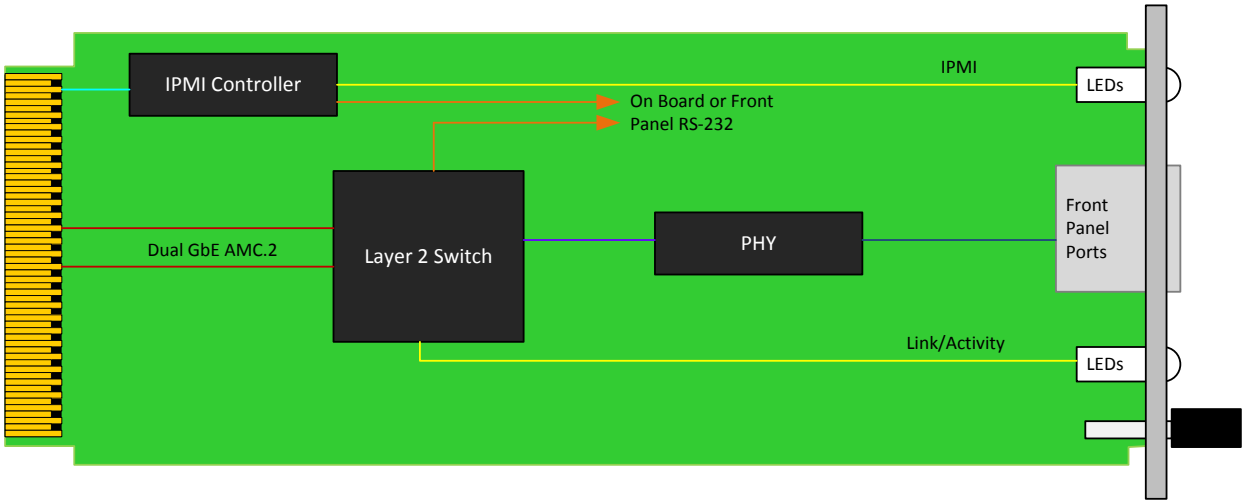


Figure 1 shows generic architecture for AMC21x, see Product Specific Description for more information on available ports and architecture for your device.

3 Functional Description

This section describes features generic to the AMC21x series, the features specific to a product are described in the subsections of Product Specific Description. Refer to the appropriate section of your device.

3.1 Front Panel

The AMC21x front panel consists of the AMC hot-swap extractor handle, I/O connectors for the Ethernet interface, and LED indicators. The LEDs are divided into two categories, the IPMI Management Controller, and the Ethernet port Link/Activity. Refer to Product Specific Description for more information on available connectors and LEDs for your device.

3.1.1 IPMI LEDs

The IPMI LEDs follow AMC specifications. The colors and meanings of the IPMI LEDs are described in Table 3. The AMC21x has an IPMI controller called a Module Management Controller (MMC) which takes care of the status LEDs, hot-swap handle, e-keying, etc.

Figure 2: IPMI LEDs

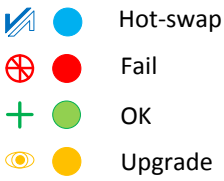


Table 3: AMC IPMI LEDs

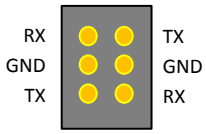
Name	Color	Description
Hot Swap	Blue	Indicates the hot-swap state, per PICMG 3.1 specification. OFF: Module active ON: OK to remove the module BLINKING: Hot-swap/power transition in progress
Fail	Red	OFF: No fault ON: Non-recoverable fault, indicates that the IPMC has not detected a good power. BLINKING: Recoverable fault
OK	Green	OFF: No payload power ON indicates that the IPMC has enabled power and payload power OK. BLINKING: Payload power OK, but held in reset (e-keying in process or failure)
Upgrade	Amber	OFF: Normal BLINKING: Firmware, SDR, or FRU upgrade is in progress

3.2 IPMI Controller

The AMC21x has a dedicated IPMI management controller. The software follows the IPMI 2.0 specification and the AMC.0 requirements.

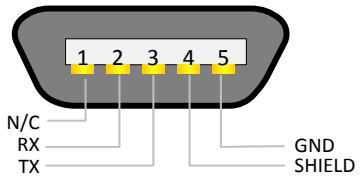
You can access the MMC serial port on AMC216 and AMC217 via a 6 pin header on the PCB. The TX, RX and Ground pins are labelled on the PCB. The serial protocol is RS-232 with **`115200 baud, N81`** settings.

Figure 3: 6 Pin Header



You can access the MMC serial port on AMC218 and AMC219 via a female micro USB connector on the front panel. The serial protocol is RS-232 with **`115200 baud, N81`** settings.

Figure 4: Micro USB RS-232 Interface



To convert the micro USB to a standard DB9 connector use Vadatech part number: CBL-DB9MUSB1.

Do not plug USB devices to the RS-232 connector, although the connector accepts USB cables, they are not electrically compatible and may cause damage to your device.

3.3 GbE Switch Set-up

Vadatech Managed Layer 2 Gigabit Ethernet switches provide easy to use web interface to configure and monitor switch features.

The GbE Switches are factory configured with the following default configuration:

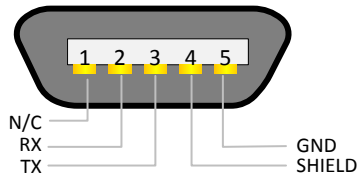
- default IP address of **`192.168.40.230`**
- default user name is **`admin`**
- default password is **`admin`**

3.3.1 Command Line Interface

If you have trouble accessing the web interface, you can use the serial port to configure and troubleshoot the GbE switch with a Command Line Interface (CLI).

The serial port is a female micro USB female connector on the front panel. The serial protocol is RS-232 with **`115200 baud, N81`** settings.

Figure 5: Micro USB RS-232 Interface



To convert the micro USB to a standard DB9 connector use Vadatech part number: CBL-DB9MUSB2 for AMC216 and use Vadatech part number: CBL-DB9MUSB1 for AMC217, AMC218 and AMC219.

Do not plug USB devices to the RS-232 connector, although the connector accepts USB cables, they are not electrically compatible and may cause damage to your device.

Once logged in, the user can start the managed switch configuration and view the current status. It is recommended that the default IP address be changed to allow multiple managed switches to be installed on a single network.

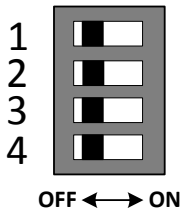
For more information on switch configuration, refer to

- *VadaTech Gigabit Ethernet Managed Switch Set-up*
- *VadaTech Gigabit Ethernet Switch Web Interface Reference Manual*

3.4 DIP Switches

The module has on the back a 4 position mechanical switch. The switch position settings should not be changed from factory default with all the four in the OFF position.as shown in Figure 6 .

Figure 6: Default Switch Settings



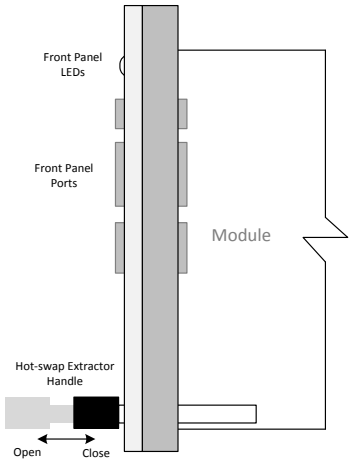
Refer to the "Component Location" section of your AMC in Product Specific Description, for more information.

4 Using the AMC21x

4.1 How to Add/Remove AMC Modules

The module should only be removed from a running carrier when the AMC Blue LED is solid ON. Removing the module before the blue LED is on may cause severe damage to the device.

Figure 7: AMC Hot-swap/Extractor Handle – Side View



4.1.1 Insert a Module

To insert a new field replaceable module, such as an AMC, into the chassis:

1. Pull out the hot-swap handle until it stops
2. Insert the module into the chassis guide rails making sure the hot swap handle is towards the lower side of the chassis (chassis with vertical slots only) and push the front panel firmly until it is fully seated into the connector. If the card does not go fully in, do not force it and instead remove it and check for proper orientation or obstructions.
3. Once fully inserted the Blue LED should go to solid ON.
4. Push in the handle to latch the module into the chassis, the Blue LED should blink for a short duration and then goes to solid OFF and the green LED would be expected to be solid ON to indicate that the payload power was applied.

4.1.2 Removing the Module

To remove a module such as an AMC:

1. Pull out the hot-swap handle until it stops (but do not pull hard enough to remove the module itself yet).
2. The Blue LED should blink for a short duration and then go solid ON.
3. Once the blue LED is ON, pull the hot-swap handle straight out firmly to remove the module from the chassis

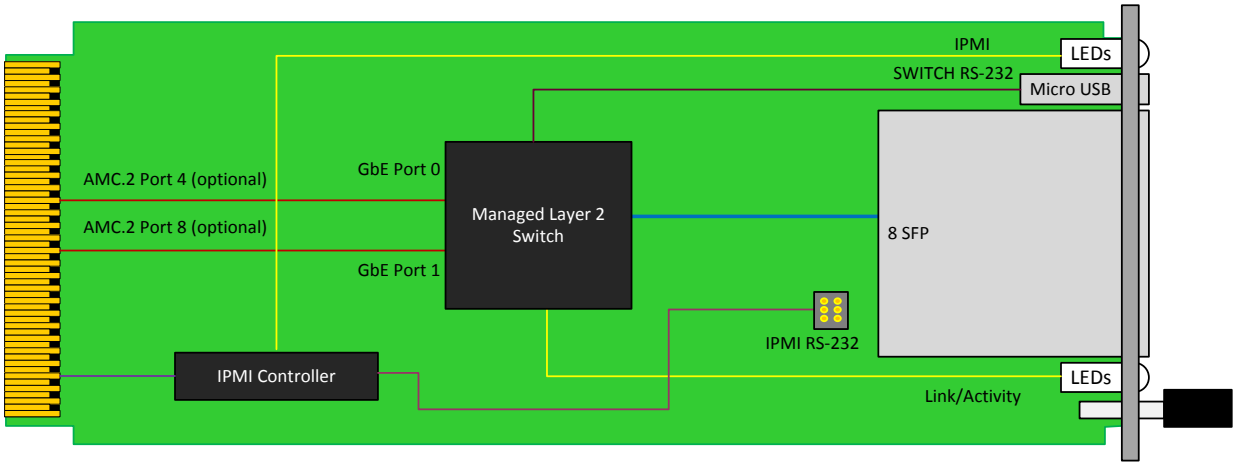
5 Product Specific Description

5.1 AMC216

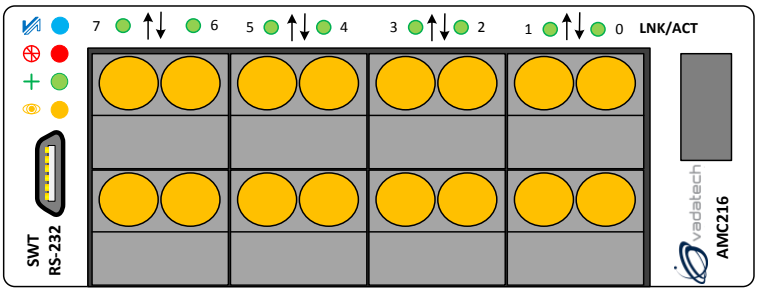
The AMC216 is a 10-port Managed Layer 2 Switch in a single-width, full-size AMC based on the AMC.2 specification. The AMC216 provide 8 front panel GbE Ethernet ports via SFP. It has two additional ports which are routed to ports 0 and 1 per the AMC.2 specification. These additional AMC ports can be routed to port 4 and port 8 by selecting ordering option E=1.

The AMC216 allows a mix of SFP interface (Fiber media such as SX or LX transceivers) and/ or copper interface on a single module. Refer to the AMC216 Datasheet for available ordering options.

5.1.1 Block Diagram



5.1.2 Front Panel



5.1.3 Ports

The AMC216 front panel provides 8 GbE ports via SFP connectors and Switch RS-232 access via a micro USB connector on the front panel. See GbE Switch Set-up for more information on serial port.

There is a 6-pin header (P2) on the PCB labelled IPMI RS-232 that provides serial access to the IPMC.

5.1.4 LEDs

The AMC216 front panel has Red, Green, Blue and Amber IPMI LEDs as described in IPMI LEDs.

There is a green LED for each port on the front panel, to indicate Link and Activity of each port. The LED is solid ON to indicate a link and blink to indicate activity.

5.1.5 Component Locations

Figure 8: AMC216 PCB - Top View

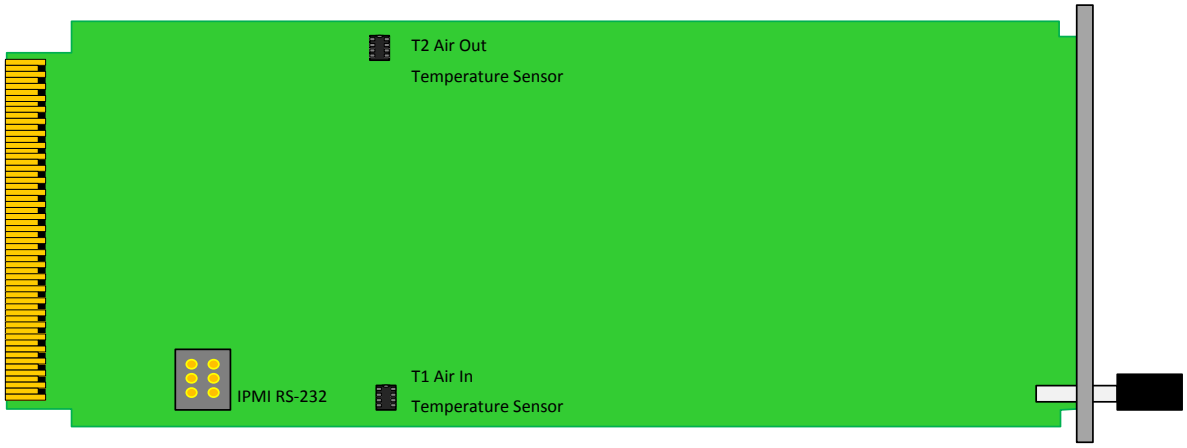


Figure 9: AMC216 PCB - Bottom View

5.1.6 Switches and Sensors

There is a single SW2 DIP switch, this switch is used for factory purpose only. Do not change the default settings of this switch, unless otherwise, suggested by Vadatech support team.

The following sensors are available on AMC216.

Table 4: AMC216 Sensors

Sensor	Description
T1	Air intake temperature sensor
T2	Air out temperature sensor
12V	Voltage sensor to monitor for any overvoltage or under voltage

The sensor threshold values are described in Table 5.

Table 5: AMC216 Sensor Thresholds

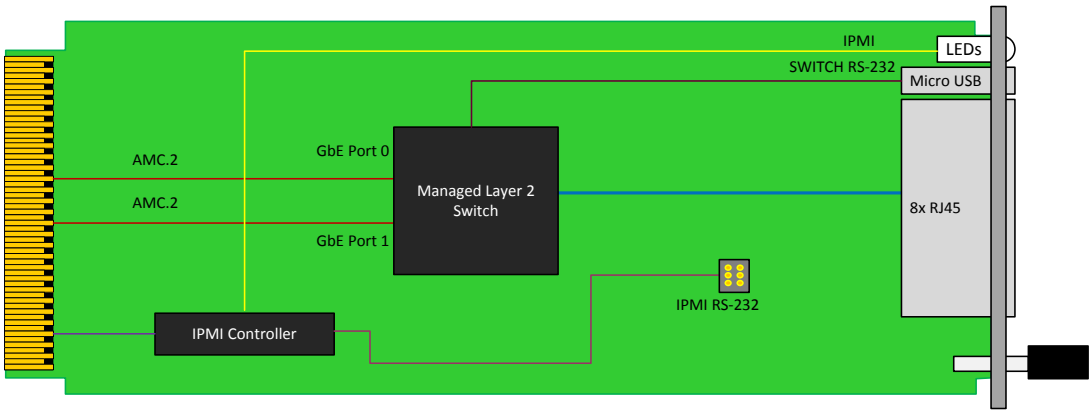
Sensors	Lower Non Recoverable	Lower Critical	Lower Non Critical	Upper Non Critical	Upper Critical	Upper Non Recoverable
T1 (in °C)	-5	5	10	65	75	85
T2 (in °C)	-5	5	10	65	75	85
12 V (in V)	–	10.23	–	–	13.75	–

5.2 AMC217

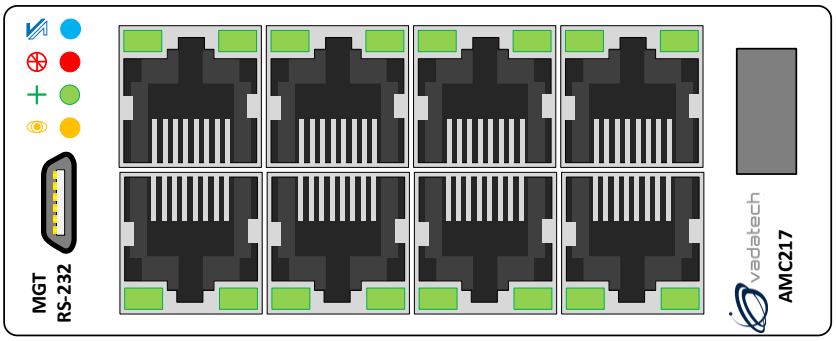
The AMC217 is a 10-port Managed Layer 2 Switch in a single-width, full-size AMC based on the AMC.2 specification. The AMC217 provide 8 front panel GbE ports via RJ-45. It has two additional ports which are routed to ports 0 and 1 per the AMC.2 specification.

Refer to the AMC217 Datasheet for available ordering options.

5.2.1 Block Diagram



5.2.2 Front Panel



5.2.3 Ports

The AMC217 front panel provides 8 GbE ports via RJ-45 connectors and Switch RS-232 access via a micro USB connector on the front panel. See GbE Switch Set-up for more information on serial port.

There is a 6-pin header (P2) on the PCB labelled IPMI RS-232 that provides serial access to the IPMC.

5.2.4 LEDs

The AMC217 front panel has Red, Green, Blue and Amber IPMI LEDs as described in IPMI LEDs.

There are two green LEDs for each port on the front panel, to indicate Link and Activity of each port. One of the LED is solid ON to indicate a link and the second LED blinks to indicate activity on the port.

5.2.5 Component Locations

Figure 10: AMC217 PCB - Top View

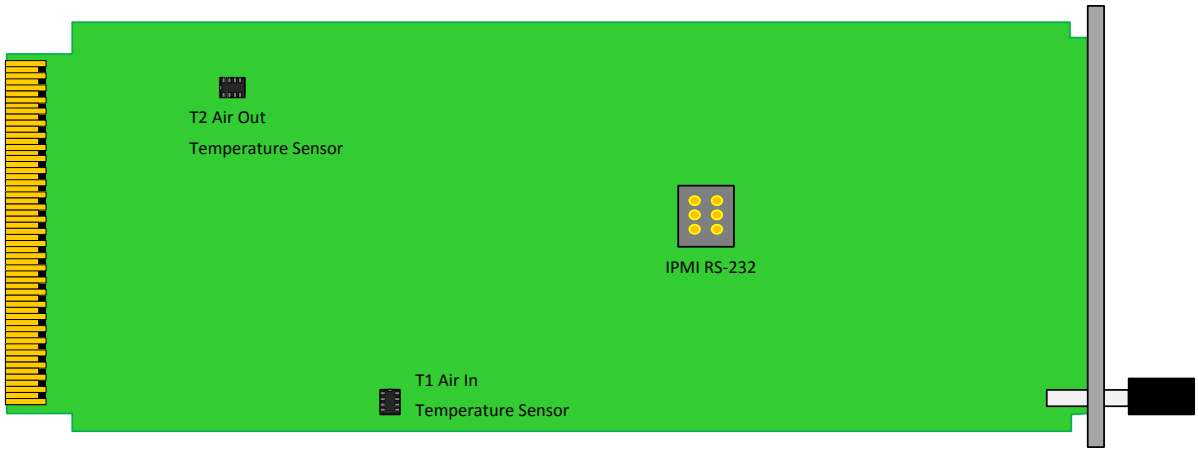


Figure 11: AMC217 PCB - Bottom View

5.2.6 Switches and Sensors

There is a single SW2 DIP switch, this switch is used for factory purpose only. Do not change the default settings of this switch, unless otherwise, suggested by Vadatech support team.

The following sensors are available on AMC217.

Table 6: AMC217 Sensors

Sensor	Description
T1	Air intake temperature sensor
T2	Air out temperature sensor
12V	Voltage sensor to monitor for any overvoltage or undervoltage

The sensor threshold values are described in Table 5.

Table 7: AMC217 Sensor Thresholds

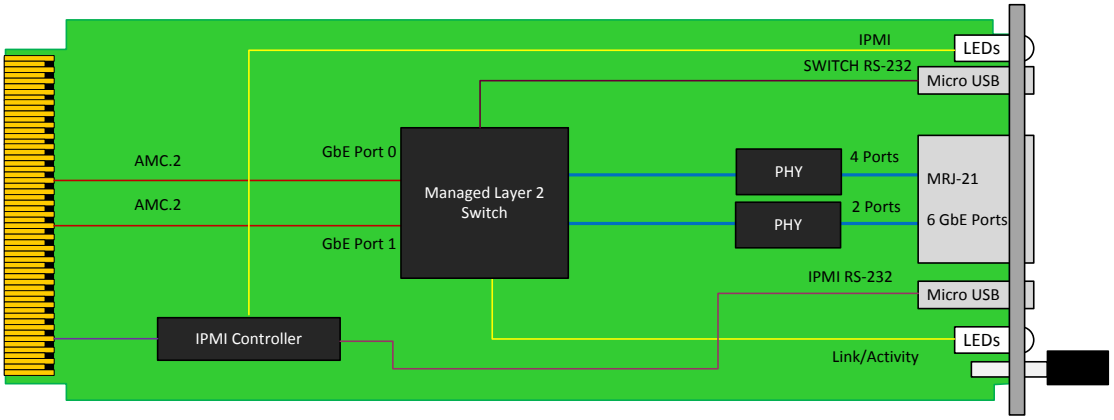
Sensors	Lower Non Recoverable	Lower Critical	Lower Non Critical	Upper Non Critical	Upper Critical	Upper Non Recoverable
T1 (in °C)	-5	5	10	65	75	85
T2 (in °C)	-5	5	10	65	75	85
12 V (in V)	–	10.23	–	–	13.75	–

5.3 AMC218

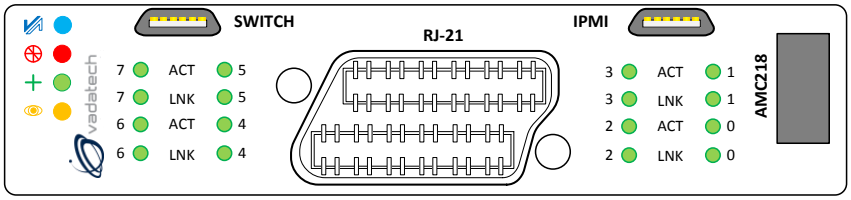
The AMC218 is an 8-port Managed Layer 2 Switch in a single-width, mid-size (optional full size) AMC based on the AMC.2 specification. The AMC218 provide 6 front panel GbE ports via MRJ-21. It has two additional ports which are routed to ports 0 and 1 per the AMC.2 specification.

Refer to the AMC218 Datasheet for available ordering options.

5.3.1 Block Diagram



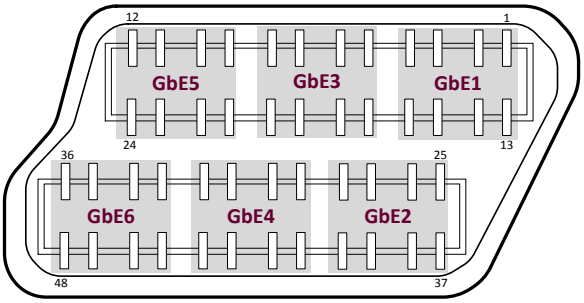
5.3.2 Front Panel



5.3.3 Ports

The AMC218 front panel provides 6 GbE ports via MRJ-21 connector and two RS-232 ports via micro USB connectors for IPMI and Switch serial access on the front panel. See GbE Switch Set-up and IPMI Controller for more information on serial port.

Figure 12: AMC218 MRJ-21 Port Distribution



5.3.4 LEDs

The AMC218 front panel has Red, Green, Blue and Amber IPMI LEDs as described in IPMI LEDs.

There are two green LEDs for each port on the front panel, to indicate Link and Activity of each port. One of the LED is solid ON to indicate a link and the second LED blinks to indicate activity on the port. There are 8 sets of LEDs to indicate the link and activity of 6 front panel ports and 2 AMC ports.

5.3.5 Component Locations

Figure 13: AMC218 PCB - Top View

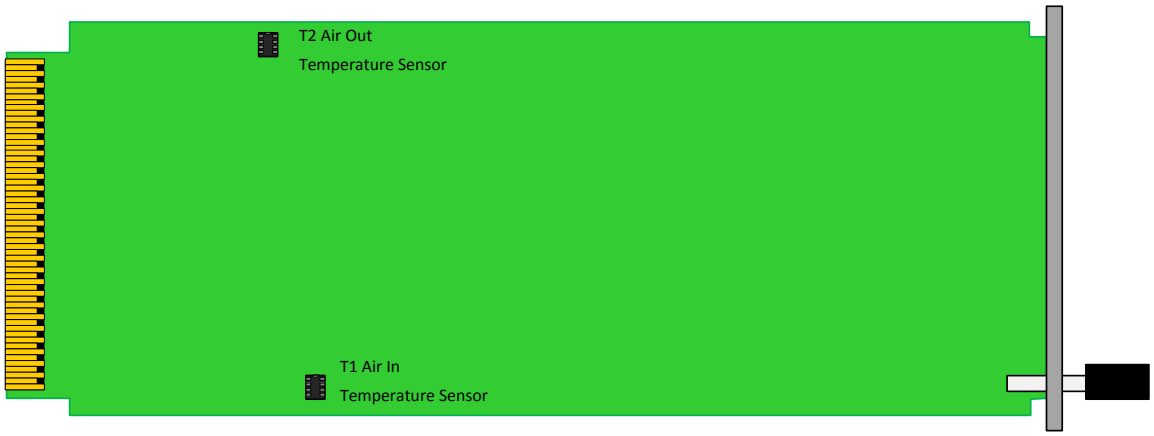
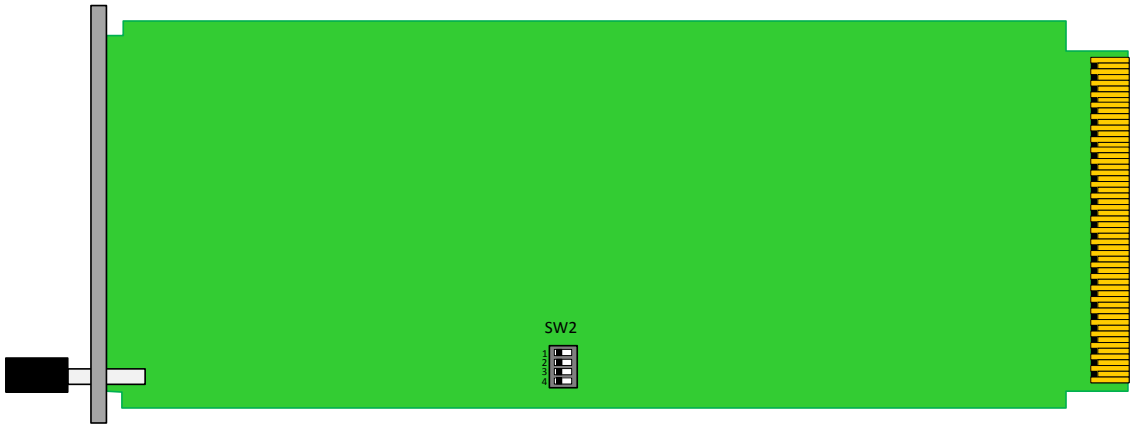


Figure 14: AMC218 PCB - Bottom View



5.3.6 Switches and Sensors

There is a single SW2 DIP switch, this switch is used for factory purpose only. Do not change the default settings of this switch, unless otherwise, suggested by Vadatech support team.

The following sensors are available on AMC218.

Table 8: AMC218 Sensors

Sensor	Description
T1	Air intake temperature sensor
T2	Air out temperature sensor
12V	Voltage sensor to monitor for any overvoltage or under voltage

The sensor threshold values are described in Table 5.

Table 9: AMC218 Sensor Thresholds

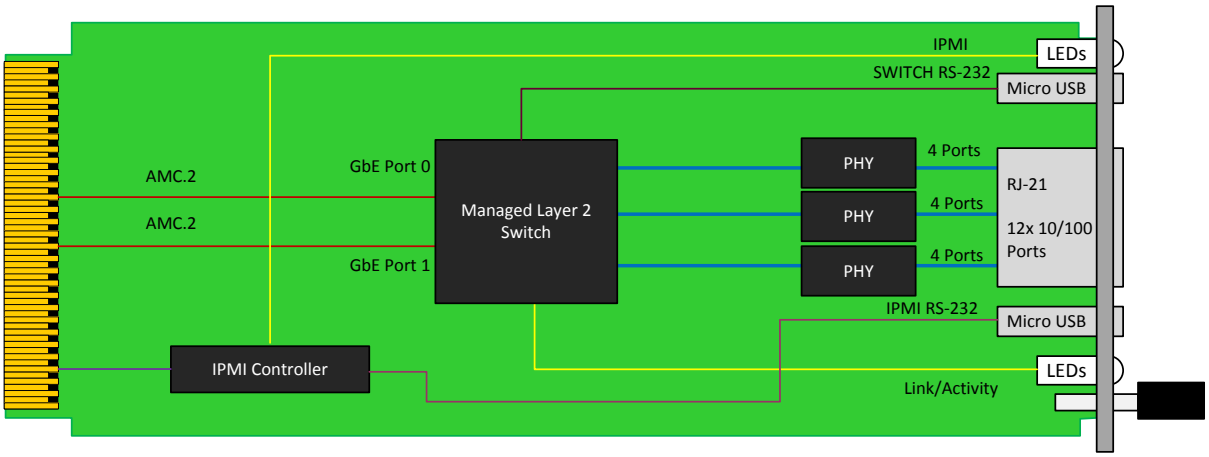
Sensors	Lower Non Critical	Lower Critical	Lower Non Recoverable	Upper Non Critical	Upper Critical	Upper Non Recoverable
T1 (in °C)	-5	5	10	65	75	85
T2 (in °C)	-5	5	10	65	75	85
12 V (in V)		10.23			13.75	

5.4 AMC219

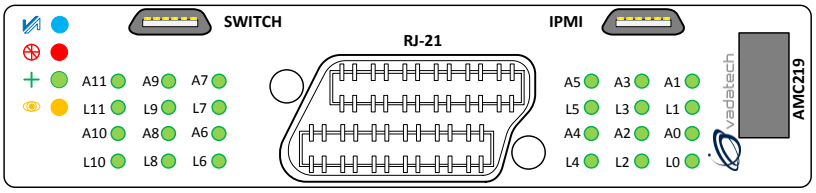
The AMC219 is a 14-port Managed Layer 2 Switch in a single-width, mid-size (optional full size) AMC based on the AMC.2 specification. The AMC218 provide 12 front panel 10/100 ports via MRJ-21 connector. It has two GbE ports which are routed to ports 0 and 1 per the AMC.2 specification.

Refer to the AMC219 Datasheet for available ordering options.

5.4.1 Block Diagram



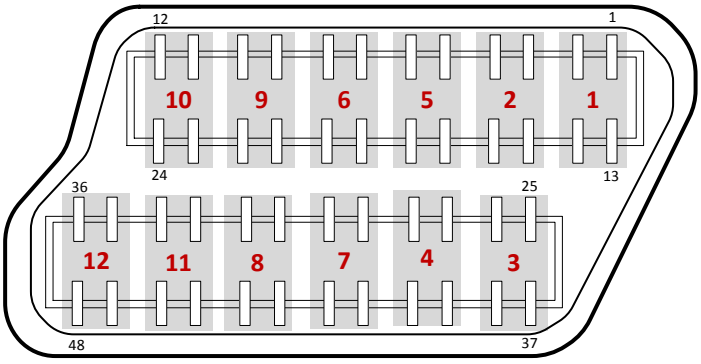
5.4.2 Front Panel



5.4.3 Ports

The AMC219 front panel provides twelve 10/100 ports via MRJ-21 connector and two RS-232 ports via micro USB connectors for IPMI and Switch serial access on the front panel. See GbE Switch Set-up and IPMI Controller for more information on serial port.

Figure 15: AMC219 MRJ-21 Port Distribution



5.4.4 LEDs

The AMC219 front panel has Red, Green, Blue and Amber IPMI LEDs as described in IPMI LEDs.

There are two green LEDs for each port on the front panel, to indicate Link and Activity of each port. One of the LED is solid ON to indicate a link and the second LED blinks to indicate activity on the port. There are 12 sets of LEDs to indicate the link and activity of the 12 front panel ports.

5.4.5 Component Locations

Figure 16: AMC219 PCB - Top View

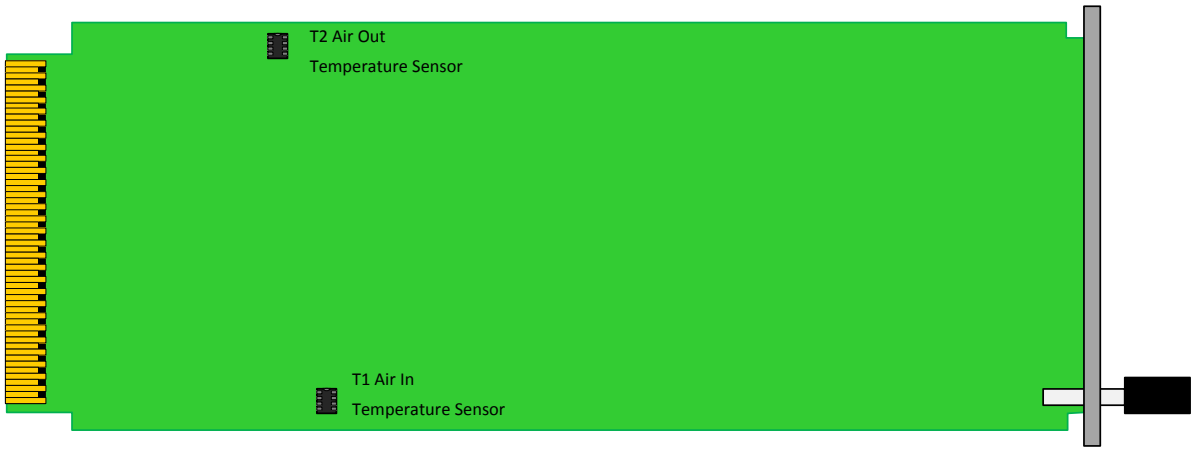
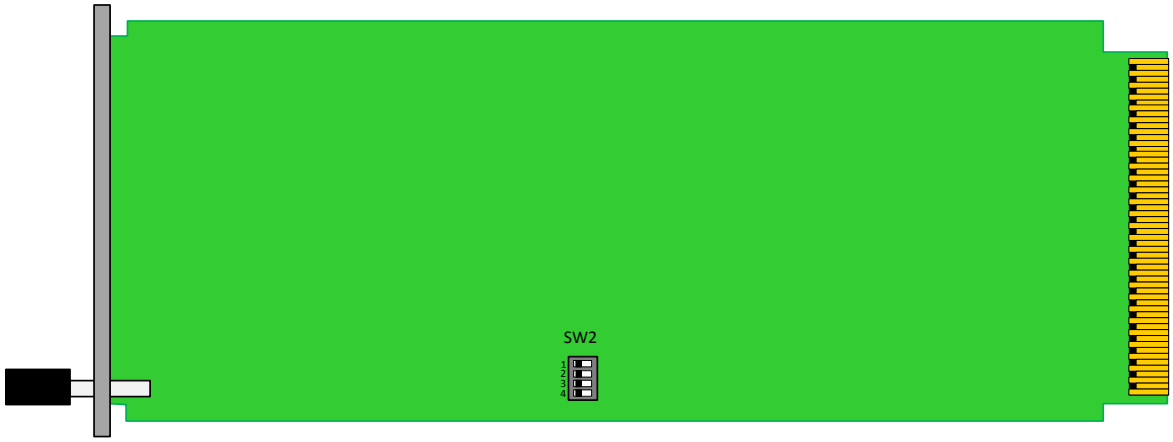


Figure 17: AMC219 PCB - Bottom View



5.4.6 Switches and Sensors

There is a single SW2 DIP switch, this switch is used for factory purpose only. Do not change the default settings of this switch, unless otherwise, suggested by Vadatech support team.

The following sensors are available on AMC219.

Table 10: AMC219 Sensors

Sensor	Description
T1	Air intake temperature sensor
T2	Air out temperature sensor
12V	Voltage sensor to monitor for any overvoltage or under voltage

The sensor threshold values are described in Table 5.

Table 11: AMC219 Sensor Thresholds

Sensors	Lower Non Critical	Lower Critical	Lower Non Recoverable	Upper Non Critical	Upper Critical	Upper Non Recoverable
T1 (in °C)	-5	5	10	65	75	85
T2 (in °C)	-5	5	10	65	75	85
12 V (in V)		10.23			13.75	

Contact VadaTech

Technical Support

If you have purchased the VadaTech product through our distributor network, contact your distributor for any technical assistance. If you require further technical support, you can contact VadaTech technical support team by forwarding your support requests to **support@vadatech.com**.

Locations

VadaTech Corporate Office	European Sales Office	Asia Pacific Sales Office
198 N. Gibson Rd Henderson, NV 89014 USA Email: info@vadatech.com Telephone: +1 702 896 3337 Fax: +1 702 896 0332	VadaTech House, Bulls Copse Road, Southampton, SO40 9LR UK Email: info@vadatech.com Telephone: +44 2380 016403	7th Floor, No 2, Wenhu Street, Neihu District, Taipei 114, Taiwan Email: info@vadatech.com Telephone: +886 2 2627 7655 Fax: +886 2 2627 7792