



ATC210 Dual Input Bus Converter

EVALUATION BOARD User Guide 207



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1. Introduction

The ATC210 Evaluation Board is designed to demonstrate the many capabilities of Artesyn's ATC210 converter. The ATC210 converter is a high density, dual-input, dual-output, 210 W Bus Converter designed to meet the requirements of the PICMG 3.0 Advanced TCA Base Specification telecommunication standard. This converter is designed to greatly simplify the power input requirements of the ATCA system boards by integrating all the necessary components (except hold-up capacitors) while operating on either of two isolated -48 Volt power inputs and providing two low voltage (12 V and 3.3 V) power outputs. Internally the ATCA converter contains, isolated ORing diodes, a hot swap controller, a 41.5 V hold-up voltage clamp to allow the use of small 50 V hold-up capacitors, an input conducted EMI filter, highly efficient 12 Vdc and 3.3 Vdc converters, a separate 12 V output switch, and a microcontroller based I²C interface circuit.

The ATC210 converter offers a wide input voltage range of -36 Vdc to -72 Vdc and can operate over an ambient temperature range of -25 °C to +85 °C. Ultra-high efficiency operation is achieved through the use of proprietary synchronous rectification and control techniques. The module is fully protected against overcurrent, overvoltage and overtemperature conditions. Standard features include isolated remote ON/OFF, A_OK and B_OK power-good indicators simplified 3.3 V margining, and I²C power and temperature monitoring.

2. Evaluation Board Functionality

The evaluation board will function when an ATC210 converter is either soldered or connected through pin sockets (jacks) to the Evaluation Board, a voltage between -36 Vdc to -72 Vdc (valid voltage) is applied to either -48V_A and RTN_A ("A" inputs), -48V_B and RTN_B ("B" inputs), and both Enable_A and Enable_B are switched on.

2.1 A_OK# and B_OK# LEDs

When Enable_A and Enable_B are switched on and a valid voltage is applied to the "A" inputs, the A_OK# LED will light and likewise when a valid voltage is applied to the "B" inputs, B_OK# LED will light. When a valid voltage is applied to both inputs, both LEDs will light.

In practice, the enable pins are the last to make contact. When they do make contact, they connect to their respective Returns, and are effectively the 'green light' for the ATCA power converter to start-up. So, with both enables switched to the 'on' position, and with either or both input feeds connected, the unit turns on.

2.2 Converter Voltage LED

The Converter Voltage LED will light when power is available to the internal IBC -48 Vdc to 12 Vdc converter.

2.3 Clamp Voltage LED

When the input voltage on the hold-up capacitors rises to above 41 volts approximately, the Clamp Voltage LED will light to indicate that the 50 V hold-up capacitors are charged to the minimum requirement, to give a 5 ms hold-up time at maximum output load of 210 Watts.

2.4 3.3 Volt LED

The 3.3 V output LED will light when 3.3 V power is available at the 3.3 V output terminals. The 3.3 V output LED will not light if the 3.3 V output voltage is less than 3.0 Volts. The 3.3 V output can drive up to a maximum load of 1.8 A.

2.5 3.3 Vout Margin Switch

Once the 3.3 V power is available, the 3.3 V output voltage can be increased or decreased by approximately 5% by switching the margin switch either HIGH or LOW.

2.5.1 Margin Switch Setting

- **High** 3.3 V output = 3.47 V
- **Normal** 3.3 V output = 3.32 V
- **Low** 3.3 V output = 3.16 V

2.6 12 V O/P Enable Switch

This switch is effectively the remote control input. It is referenced to the secondary side, and uses the 3.3 V output to enable/disable the 12 V output.

2.7 12 V LED

The 12 V output LED will light when the 12 V is switched ON and power is available at the 12 V output terminals. The 12 V output LED will not light if the 12 V output voltage is less than 11.3 V. The 12 V output can drive up to a maximum load of 17.5 A including the 1 W on board fan. The 12 V fan will operate when 12 V is available on the 12 V output. The fan can also be powered by an external 12 V supply.

2.8 Interrupt LED

This LED will light whenever the interrupt line is active low. An interrupt occurs whenever an internal parameter limit is violated. The limits can be changed from the default values via the I²C bus.

3. Connecting Up and Interfacing the I²C Bus

This section describes in detail how to connect and install the software.

The following list of items are supplied:

- Evaluation Board with ATC210 converter attached
- iPort/AFM RS-232 to I²C Bus Host Adaptor
- I²C Interface Cable
- RS-232 Serial Port Cable, 9F/25M
- Mains Power Supply

1. Download the ATC210 Evaluation Board Interface Program from the Artesyn web site via the following link:
http://www.artesyn.com/registration/resource/ResourceProvider?target=/media/pdfs/atc210_sw_download.zip
2. Install the downloaded ATC210, there may be a need to load Microsoft's .Net Framework version 1.1. This software is available via the following link:
<http://www.microsoft.com/downloads/details.aspx?FamilyID=262d25e3-f589-4842-8157-034d1e7cf3a3&displaylang=en>
3. Connect the RS-232 cable between the iPort and the serial port of the PC. If there is more than one serial port, the Interface Program will connect automatically. The 'pull-ups' switch on the iPort must be left in the default 'off' position when operating with this Evaluation board. The iPort is manufactured by MCC, p/n MIIC-203G, www.mcc-us.com.
4. Connect the I²C Interface Cable between the Evaluation board and the iPort.
5. Plug the 5 V power supply into the ac outlet using the appropriate Adaptor. Connect the other end to the iPort.
6. Double click on the ATC210 I²C icon that is on the desktop to start the program.

- Power up the Evaluation Board. Make sure that both ENABLE switches are in the 'on' position, and that the 12 V O/P switch is also 'on'. Operational voltage is between -36 Vdc and -72 Vdc. Input voltage should not exceed 75 V.
- Once powered up, the I²C communications can be initiated by clicking on the 'Connect I²C' button in the Interface Program. A successful connection will indicate 'iPort/AFM Found' and 'ATCA Responding' in the message box on the top right hand side.

Once the I²C communication has been established, the register values and parameter values are read once and appear on the interface. Reading or writing functions can be performed manually or automatically. For more information on using the ATC210 Evaluation Board Interface Program click on Help.

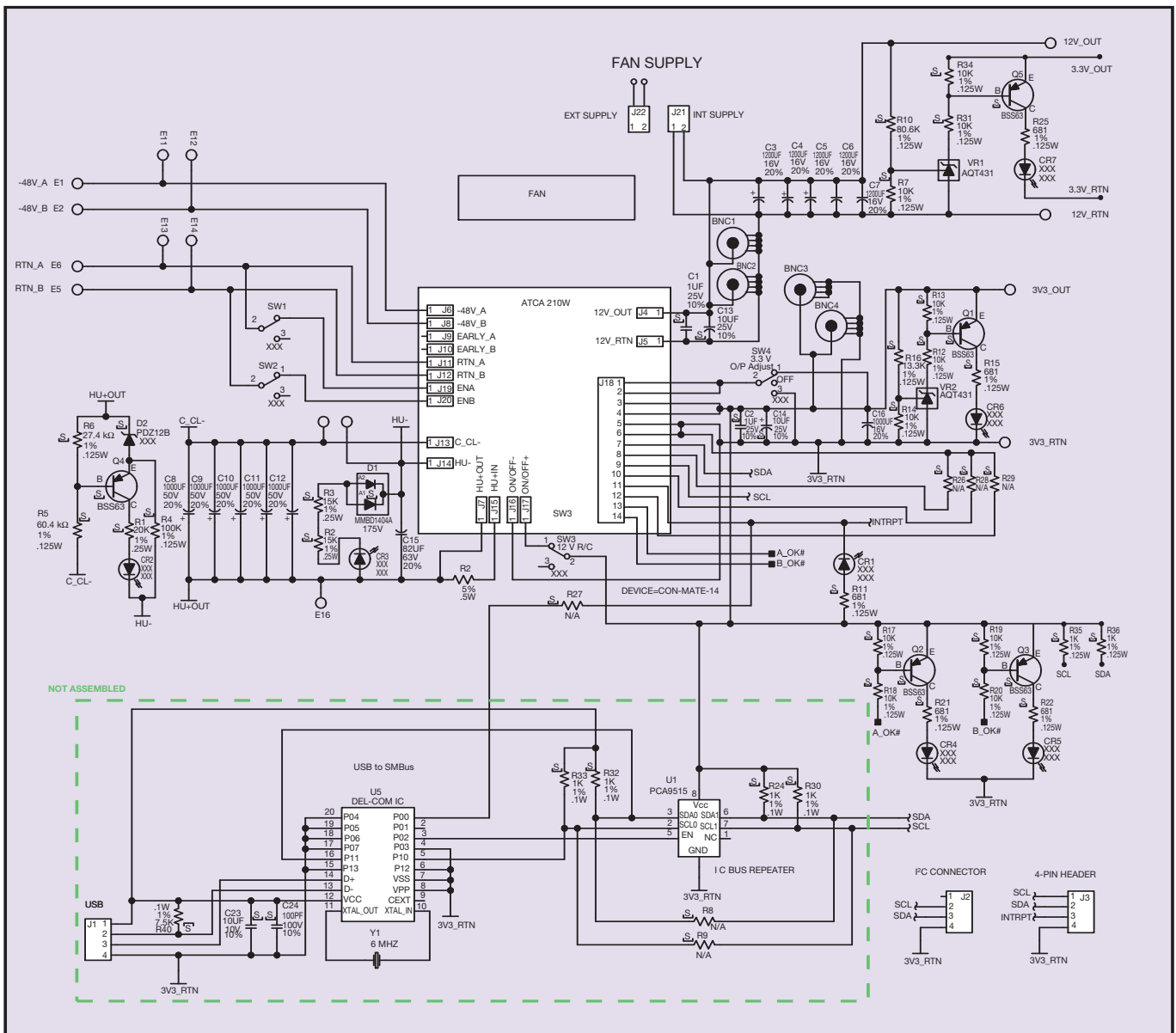


Figure 1: Evaluation Board Schematic

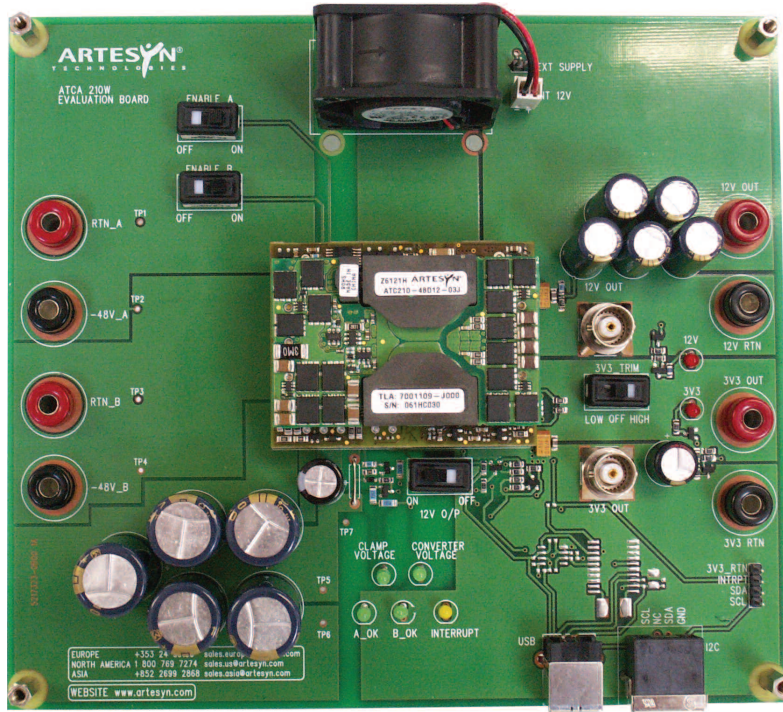


Figure 2: Photograph of the Evaluation Board

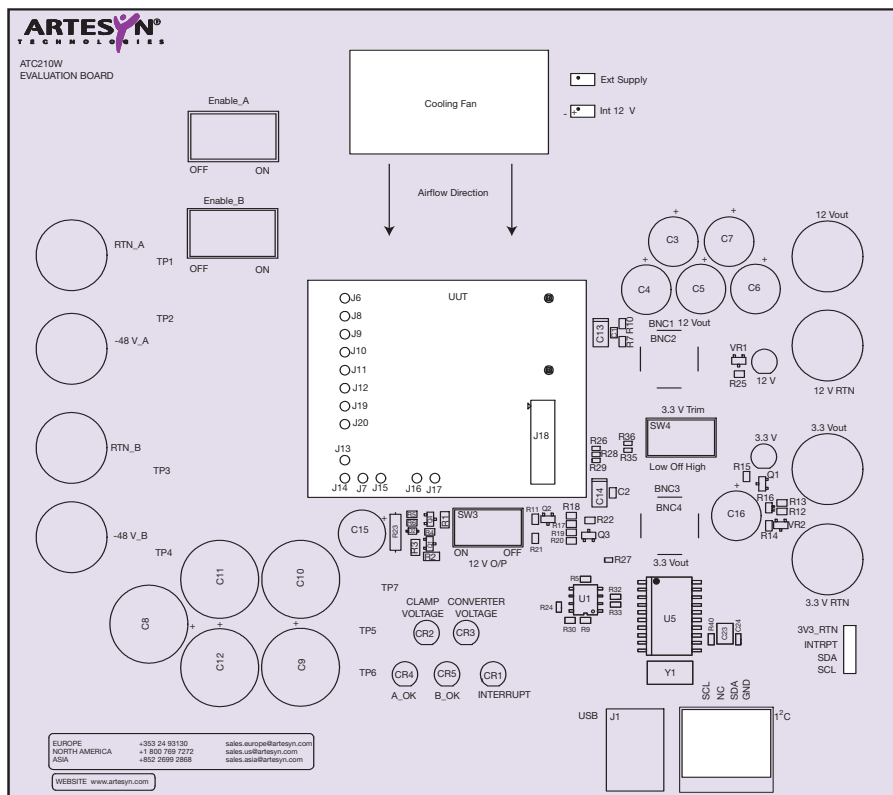


Figure 3: Evaluation Board Layout