PMC ASYNC

"Tech Refresh" RS232/422/485 Asynchronous Communications Adapter PMC

The Technobox RS232/422/485 Asynchronous Communication Adapter PMC is a tech refresh of our popular 8- and 16- port Async PMCs, such as P/N 5284 (8xRS232), 5288 (8xRS422), and 5436 (16xRS232) products to remove EOL parts as well as enhance longevity of the product family.

By incorporating the PCI interface (PCI9030/9052 bridges) and UARTs (16C554 chips) in an FPGA, dependence on risky or EOL parts is eliminated. Longevity is better assured. Even if the FPGA itself becomes obsolete, a newer FPGA can be designed in, and the original FPGA code and I/O interface devices can be reused.

This tech refresh product is designed to be a customer-transparent, 100% replacement, of the original boards. Key changes are highlighted in the Technical Comparison Table, below. Although moving from 5V to 3.3V powered I/O devices, the newer 3.3V devices are compliant with the RS232, RS422, and RS485 electrical standards.

Like the previous PCI9030 bridge-based products, both +3.3V and +5V PCI bus signaling levels are supported. This is done through voltage-limiting, zero-delay FETs; this is a common methodology in interfacing elevated voltages to a 3.3V FPGA. The FPGA parallel-PCI specific pins are implemented for PCI compliance. Note that some older Technobox Async PMCs, such as P/Ns 2316 and 2229, used the 5V only PCI9052 bridge.

This design is exceptionally versatile and is partitioned into eight "sections," each to support any of the following:

- RS232 – standard 8 COM port signals (RXD,TXD,RTS,CTS,RI,DTR,DSR,DCD)
- RS422 – standard 4 COM port signals (RXD,TXD,RTS,CTS)
- "Split partitioning" of the section into two independent functions.

When a section is configured for "Split partitioning," each half of the section is designed to support any of the following:

- RS232 – standard 4 COM port signals (RXD,TXD,RTS,CTS)
- RS422 – standard 2 COM port signals (RXD, TXD)
- RS485 – bidirectional RS485 data on one differential pair (TXRXD)

As a result of the adapter's architecture, many combinations of I/O signaling levels can be quickly realized. Furthermore, customer-specific applications requiring a mix of various interfaces - e.g. RS232, RS422 and RS485 - is easily achieved.

To facilitate quick-turn delivery to customers, a ready inventory of partially assembled boards is kept in stock. The secondary side is populated the same way for all configurations, consisting of mostly bypass capacitors and common elements. When a customer order is received, the primary side is then populated appropriately, resulting in the customer-required configuration. For example, changes in termination resistances, which are variations on the primary side population, can be easily and quickly accomplished to meet customer requirements.

Employing this unique method of selective population results in highly reliable,

- **100% Functional Replacement for Select Technobox 8- and 16-port Async PMCs**
- **FPGA-based Design to Mitigate Obsolescence**
- **Supports Both +3.3V & +5V PCI Bus Signaling Levels**
- **Compliant with RS232, RS422 & RS485 Electrical Standards**
- **Versatile Architecture Allows Partitioned I/O Configurations**
- **Customized Solutions Can Be Quickly Realized**
- **Options Available for Front-Panel I/O Breakout**
- **RoHS Compliant**
- **Industrial Temp**

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Function	PMC Leaded/RoHS	Tech Refresh	Note
8-port RS232	2229/5284	P/N 9496	Drop-in replacement
8-port RS422	2316/5288	P/N 9502	Drop-in replacement
4-/4- port RS232/422	3101/5382	P/N 9490	Drop-in replacement
16-port RS232	2238/5436	P/N 9477	Drop-in replacement
16-port RS422	N/A	P/N 9484	New configuration
Various combinations	N/A	P/Ns TBD	Versatility of this tech refresh design

highly configurable Async boards without using any switches, jumpers, plug-on sub-mezzanines, and so forth.

This single design covers the functionality of various existing Technobox Async PMCs in the provided table above.
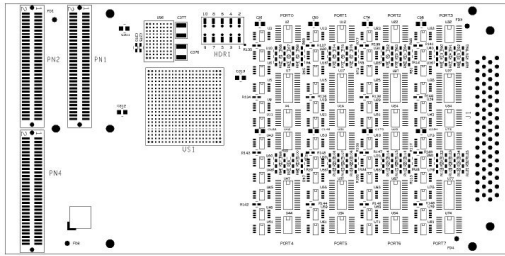
Various breakout panels and cable accessories are available to convert the 68-pin front-panel connector to other standard connectors. For example, P/N 4988 transition panel converts from 68-pin to eight DB9 connectors.
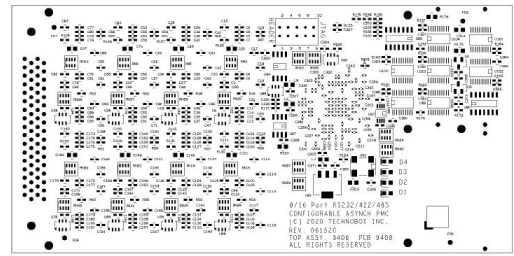
This product is built with industrial temperature range parts (-40 to +85 C) and is RoHS compliant.
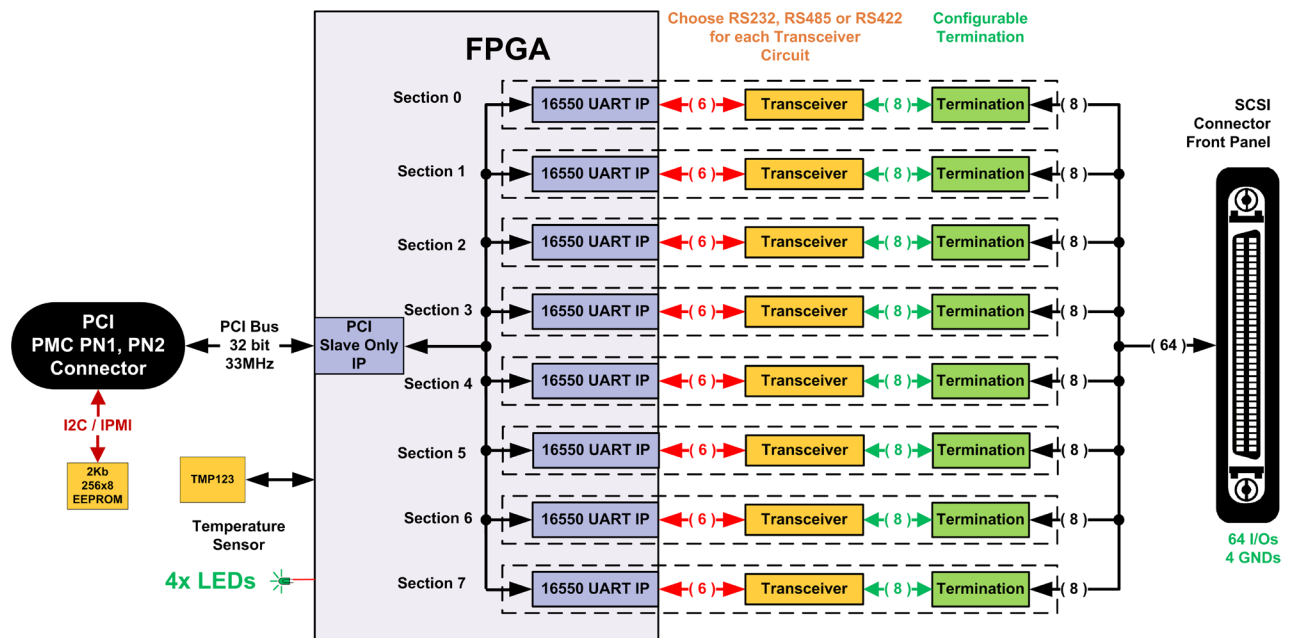
COMPONENT PLACEMENT VIEW - SIDE #1

COMPONENT PLACEMENT VIEW - SIDE #2

SPECIFICATIONS

Temperature (Operating): -40 to +85 degrees C

Temperature (Storage): --55 to +105 degrees C

Altitude: Not specified or characterized. Typical similar equipment is at 15,000 ft.

Humidity (Operating/Storage): 5% to 90% non-condensing.

Vibration: Not specified or characterized

Shock: Not specified or characterized

MTBF: Available upon request

Power: TBD, dependent on configuration type

PCI Interface: 33MHz, 32 bit, VIO +3.3V or +5.0V

Voltages Required: +5V only

Size: 74mm x 143.7mm

PCB Thickness: 1.57 mm / 0.062 +/- 10% as per standard PCBs

ORDERING INFORMATION

9502: 8-Port RS422

9496: 8-Port RS232

9490: 4-/4- Port RS232/422

9484: 16-Port RS422

9477: 16-Port RS232

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TECHNICAL COMPARISON TABLE - PMC ASYN TECH REFRESH

Function	Original PMC	Tech refresh PMC	Comment
+3.3V PMC Power	Not used	Not used	Neither use PMC 3.3V.
+5V PMC Power	Used	Used	+5V still primary supply. For tech refresh, DC to DC supplies +3.3V locally from +5V.
+/-12V PMC power	Used	Not used	Was for the original +/-12V powered RS232
RS232 Driver	GD65232DW (+/-12V pwr)	MAX3243 (3.3V pwr)	MAX parts now commonly used for RS232, removing need for +/-12V
RS232 Receiver	GD65232DW (+/- 12V pwr)	MAX3243 (3.3V pwr)	MAX parts now commonly used for RS232, removing need for +/-12V
RS422 Driver	26C31 (5V pwr)	ISL3177E (3.3V pwr)	ISL3177 has both RX and TX
RS422 Receiver	26C32 (5V pwr)	ISL3177E (3.3V pwr)	ISL3177 has both RX and TX
RS485 Transceiver	LTC1487 (5V pwr)	ISL3178E (3.3V pwr)	Both are half-duplex RS485's
UART	16C554	IP in FPGA	Removes discrete chip. Uses UART IP in FPGA.
PCI to Local Bridge	PCI9030/9052	IP in FPGA	Slave only PCI now in FPGA. Hedge against Broadcom/PLX obsolescence.
PMC VIO, signaling	+5V or +3.3V ("Universal")	+5V or +3.3V ("Universal")	PCI9030 supported +3.3 or +5V VIO. PCI9052 supported +5V only. Tech refresh supports +3.3V and +5V via FET level shifters for FPGA compatibility.
Configuration	Different PCB designs	One PCB design; selective primary side population.	New manufacturing strategy, reducing PCB designs and enhancing configuration with a single foundation PCB. JIT manufacturing, buying expensive parts as needed.
Interrupt steering	MAX3064ATI4	IP in FPGA	Designs had interrupt steering scheme, retained.

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