PCI, PCIe, mPCIe, cPCI, and PC104+ Plus Modules

Data Sheets of TEWS’ I/O Modules and Carrier

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Quality Assurance / Warranty

TEWS operates three subsidiaries to meet global demand for pre and post sales support, reduced development time, long term product availability, and complete product lifecycle management.

TEWS is committed to continuously improving the quality of our products and services. As a reflection of our commitment to quality, TEWS has implemented and received ISO9001:2008 certification.

All TEWS’ products feature a five-year limited warranty.

RoHS / WEEE Compliance

TEWS TECHNOLOGIES believes in conducting business in a manner that respects the environment and consequently has embraced the RoHS regulations of the European Community.

Non-compliant products will continue to be available for all applications which are exempt from the RoHS directives and have a continuing requirement for leaded solder.
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PCI Modules

PCI is the most widely-used computer board form factor and bus structure in the world of personal computer technology. With the introduction of high-reliability systems and ruggedized packaging, the use of standard PCI edge cards has spread widely into the industrial and COTS marketplaces. Demand for functionality such as serial communications, field bus, networking, analog and digital I/O, and motion control has increased.

In addition to our well known PCI modules, we offer a complete line of CompactPCI, PCI Express, PCI Express Mini Card, VMEbus, PMC, XMC, PC104+, AMC, MicroTCA, FMC, and numerous IndustryPack modules off-the-shelf.

Software support for major operating systems such as Windows, Linux, Integrity, VxWorks, and QNX is available. All products feature a five-year warranty.

If you wish to inquire about custom PCI designs, please contact TEWS directly at our offices in Germany or the United States. TEWS works closely with OEM and government customers to deliver accelerated time to market, long-term product availability and comprehensive product lifecycle management -- from the design stage through manufacturing, testing and beyond to post-sales support. For more information go to www.tews.com.
Application Information

The TPCI868 is a standard 33 MHz 32 bit PCI module and provides 16 asynchronous RS232 serial interface channels. The TPCI868 requires the 3.3V PCI power supply and operates in a 3.3V or 5.0V PCI I/O voltage environment.

The module uses a 14.7456 MHz crystal oscillator which allows baud rates up to 921.6 kbaud. All 16 serial channels can generate interrupts on the PCI bus. The interrupt status information can be accessed via the 16 bit wide interrupt status register.

For the serial interface the signals TxD, RxD, RTS#, CTS# and GND are available on the HD68 front panel connector. A 10-pin JTAG header is available for XMC module debugging purposes. All five JTAG signals are routed directly to the XMC slot.

Software Support (TPCI868-SW-xx) for different operating systems is available.

Technical Information

- PCI Card Interface
- PCI 2.2 compliant interface
- 3.3V and 5V PCI Signaling Voltage
- Size: 102 mm x 135 mm
- 16 channel asynchronous RS232 serial interface

- Both 3.3V and 5.0V PCI I/O voltage support
- Support of TxD, RxD, RTS#, CTS# and GND per channel
- Baud rates up to 921.6 kbaud
- HD68 SCSI-3 type female connector
Order Information

RoHS Compliant
TPCI868-10R 16 Channel Serial RS232, HD68
For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TPCI868-DOC User Manual

Software
TPCI868-SW-25 Integrity Software Support
TPCI868-SW-42 VxWorks Software Support (Legacy and VxBus-Enabled Software Support)
TPCI868-SW-65 Windows Software Support
TPCI868-SW-82 Linux Software Support
TPCI868-SW-95 QNX Software Support
For other operating systems please contact TEWS.

Related Products
TA304 Cable Kit for modules with HD68 connector
Application Information

The TPCI100 is a standard 33 MHz 32 bit PCI Carrier for up to two single-size or one double-size IndustryPack (IP) modules allowing to build up modular, flexible and cost effective I/O solutions for all kinds of applications like process control, medical systems, telecommunication and traffic control.

Two 50 pin 0.1 inch flat ribbon cable connectors provide access to all IP I/O lines. Status indicators for IP access, +5V and +/-12V are provided.

The TPCI100 can operate with 3.3V and 5.0V PCI I/O signaling voltage for I/O. This guarantees compatibility with nearly all PC mainboards. 3.3V required by on board logic is generated locally.

All IP interrupt request lines are mapped to PCI INTA. For fast interrupt source detection, the TPCI100 provides a special IP interrupt status register.

The IP power lines are fuse protected by self healing fuses and RF filtered. The operating temperature range is -40°C to +85°C.

Software Support (CARRIER-SW-xx) for different operating systems is available.
Technical Information

- PCI Card Interface
  - PCI 2.2 compliant interface
  - Size: 107 mm x 125 mm
  - PCI I/O signaling voltage: 3.3V or 5.0V
  - ANSI/VITA 4-1995 compliant interface to IndustryPack modules
    - IndustryPack slots: two single-size or one double-size
  - 8/32 MHz interface, no DMA
  - 8 Mbytes memory space per IP
  - Routing of all IP interrupts to PCI INTA, local interrupt status register

- I/O access: 50 pin 0.1 inch flat ribbon cable connector per IP

- Status LED’s
  - ACK LED for each IP module
  - +5V Power LED for each IP slot
  - +12V and –12V Power LED

- Self Healing fuses and RF-filtering on all IP power lines

- Operating temperature –40°C to +85°C
Order Information

RoHS Compliant
TPCI100-10R  2 Slot IndustryPack Carrier, 50 pin ribbon cable connectors

For the availability of non-RoHS compliant (lead solders) products please contact TEWS.

Documentation
TPCI100-DOC  User Manual

Software
CARRIER-SW-42  VxWorks Software Support (Legacy and VxBus-enabled Software Support)
CARRIER-SW-65  Windows IP Carrier Software Support
CARRIER-SW-82  Linux IP Carrier Software Support
CARRIER-SW-95  QNX IP Carrier Software Support

For other operating systems please contact TEWS.

Related Products
TA305  Cable Kit for modules with 50 pin ribbon cable connector
TPCI200  PCI Carrier for 4 Industry Packs®

Application Information

The TPCI200 is a standard 33 MHz 32 bit PCI Carrier for up to four single-size or two double-size IndustryPack (IP) modules used to build modular, flexible and cost effective I/O solutions for applications in process control, medical systems, telecommunication and traffic control.

Four 50 pin 0.1 inch flat ribbon cable connectors provide access to all IP I/O lines. Status indicators for IP access, +5V and +/-12V are provided.

The TPCI200 can operate with 3.3V and 5.0V PCI I/O signaling voltage for I/O. This guarantees compatibility with nearly all PC mainboards. 3.3V required by on board logic is generated locally.

All IP interrupt request lines are mapped to PCI INTA. For fast interrupt source detection, the TPCI200 provides a special IP interrupt status register.

The IP power lines are fuse protected by self healing fuses and RF filtered. The operating temperature range is -40°C to +85°C.

Software Support (CARRIER-SW-xx) for different operating systems is available.

Technical Information

- PCI Card Interface
  - PCI 2.2 compliant interface
  - Size: 107 mm x 270 mm
  - PCI I/O signaling voltage: 3.3V or 5.0V
  - ANSI/VITA 4-1995 compliant interface to IndustryPack modules
    - IndustryPack slots: Four single-size or two double-size
    - 8/32 MHz interface, no DMA
    - 8 Mbyte memory space per IP
    - Routing of all IP interrupts to PCI INTA, local interrupt status register

- I/O access: 50 pin 0.1 inch flat ribbon cable connector per IP

- Status LED’s
  - ACK LED for each IP module
  - +5V Power LED for each IP slot
  - +12V and −12V Power LED

- Self Healing fuses and RF-filtering on all IP power lines

- Operating temperature -40°C to +85°C

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Order Information

RoHS Compliant
TPCI200-10R 4 Slot IndustryPack Carrier, 50 pin ribbon cable connectors
For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TPCI200-DOC User Manual

Software
CARRIER-SW-42 VxWorks Software Support (Legacy and VxBus-enabled Software Support)
CARRIER-SW-65 Windows IP Carrier Software Support
CARRIER-SW-82 Linux IP Carrier Software Support
CARRIER-SW-95 QNX IP Carrier Software Support
For other operating systems please contact TEWS.

Related Products
TA305 Cable Kit for modules with 50 pin ribbon cable connector
TPCI270 PMC Carrier for PCI Card Interface

Application Information

The TPCI270 is a standard 33 MHz, 32 bit PCI carrier for a single PMC Card. It provides PMC front I/O and PMC P14 rear I/O. This PMC to PCI adapter is used to build modular, flexible and cost effective I/O solutions with PMC devices in standard PCI systems.

The TPCI270 is used as a mechanical adapter to connect a PMC module into standard PCI bus based systems. Operation with 3.3V and 5.0V PCI I/O signaling voltage guaranties compatibility with nearly all PC main boards.

The TPCI270-2xR provides a local 3.3V Generation with a typical current limit of 2A for PC mainboards that do not support 3.3V as PCI supply voltage.

The TPCI270 offers standard PMC front I/O and PMC P14 rear I/O routed to a VME P2 style connector (603-2-IEC-C064-M).

Operating temperature range is -40°C to +85°C.

Technical Information

- PCI Card Interface, PCI 2.2 compliant interface
- One PMC sites conforming to PMC standard (IEEE 1386)
- PCI Interface: 33 MHz; 32 bit
- PCI I/O signaling voltage: 3.3V or 5.0V PCI 2.2 compliant interface
- Front panel I/O
- PMC P14 rear I/O connected to VME P2 style connector (603-2-IEC-C064-M)
- Size: 107 mm x 170 mm
- Operating temperature -40°C to +85°C.
Order Information

RoHS Compliant
TPCI270-10R  1 Slot Passive PMC Carrier
TPCI270-20R  1 Slot Passive PMC Carrier, on board generation of 3.3V

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TPCI270-DOC  User Manual
PCIe Modules

TEWS TECHNOLOGIES is expanding its I/O offering from PMC and IndustryPack modules to include PCIe form factor solutions. With our background and long-term experience in interface products based on IndustryPack, PMC, XMC, CompactPCI, PCI, PCI Express, PCI Express Mini Card, VMEbus, PC104+, AMC, MicroTCA, and FMC industrial standards, TEWS is applying its expertise to the introduction of PCIe modules.

If you wish to inquire about custom PCIe designs, please contact TEWS directly at our offices in Germany or the United States. TEWS works closely with OEM and government customers to deliver accelerated time to market, long-term product availability and comprehensive product lifecycle management -- from the design stage through manufacturing, testing and beyond to post-sales support. For more information go to www.tews.com.
TPCE863  4 Channel High Speed Synch/Asynch Serial Interface

Application Information

The TPCE863 is a standard height, half-length PCI Express 1.1 compliant module with four high speed serial data communication channels.

The serial communication controller is implemented in FPGA logic, along with a bus master capable PCI interface, guaranteeing long term availability with the option to implement additional functions in the future. The FPGA is connected to the PCI Express interface via a transparent PCI Express to PCI bridge.

Each channel has a receive and a transmit FIFO of 512 long words (32 bit) per channel for high data throughput.

Data transfer on the PCI Express bus is handled via TPCE863 initiated DMA cycles with minimum host/CPU intervention.

Several serial communication protocols are supported by each channel, such as asynchronous, isochronous, synchronous and HDLC mode.

A 14.7456 MHz oscillator provides standard asynchronous baud rates. A 24 MHz and a 10 MHz oscillator are provided for other (synchronous) baud rates.

Additionally each channel provides various interrupt sources, generated on INTA. The interrupt sources can be enabled or disabled individually.

Multiprotocol transceivers are used for the line interface. The physical interface is selectable by software, individually for each channel as EIA-232, EIA-422, EIA-449, EIA-530, EIA-530A, V.35, V.36 or X.21.

A HD68 SCSI-3 type connector at the front panel provides access to the I/O lines.

The following signals are provided by the TPCE863 for each channel at the front I/O connector:

- Receive Data (RxD +/-), Transmit Data (TxD +/-), Receive Clock (RxC +/-), Transmit Clock (TxC +/-), Ready-To-Send (RTS +/-), Clear-To-Send (CTS +/-), Carrier-Detect (CD +/-) and GND.
- Additionally, serial channel 3 provides Data-Set-Ready (DSR3 +/-) and Data-Terminal-Ready (DTR3 +/-).

A serial EEPROM is used to store detailed board information and special configuration parameters.

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**Technical Information**

- Form Factor: PCISIG PCI Express Revision 1.1
  - Board size: 129.4 mm x 106.7 mm
  - Standard height, half length
- Four high speed synchronous/asynchronous serial interfaces
- Support of RxD, TxD, RxC, TxC, RTS, CTS, CD and GND on front connector, DTR3 and DSR3 on channel 3 only
- Physical interface (individually programmable per channel):
  - EIA-232, EIA-422, EIA-449, EIA-530, EIA-530A, V.35, V.36 and X.21

- Maximum data rate: 10 Mbit/s (synchronous), 2 Mbit/s (asynchronous), internal or external provided clock
- EIA-232: up to 115.2 kbit/s
- Operating temperature: -40°C to +85°C

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**Parameter**

**EEPROM**

**FPGA**

**Local Interface** (x4)

**Multiprotocol Line Transceiver**

**Line Interface** (x4)

**PCI Express to PCI Bridge**

**PCI Bus**

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The Embedded I/O Company

Order Information

RoHS Compliant
TPCE863-10R  4 Channel High Speed Synch/Asynch Serial Interface, HD68
For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TPCE863-DOC  User Manual

Software
TDRV009-SW-25  Integrity Software Support
TDRV009-SW-42  VxWorks Software Support (Legacy and VxBus-Enabled Software Support)
TDRV009-SW-65  Windows Software Support
TDRV009-SW-82  Linux Software Support
TDRV009-SW-95  QNX Software Support
For other operating systems please contact TEWS.

Related Products
TA304  Cable Kit for modules with HD68 connector
**TPCE200** PCI Express Carrier for 4 IndustryPack® Modules

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**Application Information**

The TPCE200 is a standard height PCI Express, Revision 2.0 compatible module that provides four slots for up to four single-size or two double-size IndustryPack (IP) modules used to build modular, flexible and cost effective I/O solutions for all kinds of applications like process control, medical systems, telecommunication and traffic control.

The TPCE200 is a versatile solution to upgrade well known IP I/O solutions to the PCI Express signalling standard.

Four 50-pin 0.1 inch flat ribbon cable connectors provide access to all IP I/O lines. LED status indicators for IP acknowledge, +5V and ±12V are provided.

The IP clock speed is selectable between 8MHz and 32MHz for each IP slot separately.

One memory space is provided for each IP, allowing linear addressing for 16-Bit memory on the IP.

The IP power lines are fuse protected by self-healing fuses and RF filtered. The operating temperature range is -40°C to +85°C.

The PCIe edge card connector provides +12V and +3.3V. The TPCE200-10R uses the +12V of the PCIe edge card connector to generate all power supply voltages for the IP slots (+5V, +12V and -12V).

According to the PCIe specification, a PCIe x1 card is limited to 6W on the +12V which allows to operate most of the available IP modules in combination on the TPCE200-10R.

For increased power requirements, the TPCE200-11R offer a PCIe Graphics Power Connector to supply the +12V for generating all the power supply voltages for the IP slots providing power of up to 25W.
Technical Information

- Form Factor: PCI Express x1, Revision 2.0
- Board size: approx. 263mm x 111mm
- ANSI/VITA 4-1995 compliant interface to IndustryPack modules
  - IndustryPack slots: Up to four single-size IPs or two double-size IPs
- 8/32 MHz interface, no DMA
- 8 Mbytes memory space per IP Slot
- Routing of all IP interrupts to PCIe INTA/MSI, local interrupt status register
- I/O access: 50-pin 0.1 inch flat ribbon cable connector for each IP slot
- Self-healing fuses and RF filtering on all IP power lines
- Status LEDs
  - ACK LED for each IP module
  - +5V Power LED for each IP slot
  - +12V and -12V Power LED
- Operating temperature: -40°C to +85°C
- MTBF (MIL-HDBK217F/FN2 G0 20°C)
  - TPCE200-10R: 338000h
  - TPCE200-11R: 315000h

Order Information

RoHS Compliant
TPCE200-10R  4 Slot IndustryPack Carrier, 50 pin ribbon cable connectors, 12V from PCIe connector
TPCE200-11R  4 Slot IndustryPack Carrier, 50 pin ribbon cable connectors, 12V from PCIe Graphics connector

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TPCE200-DOC  User Manual

Software
Carrier-SW-42  VxWorks Software Support (Legacy and VxBus-Enabled Software Support)
Carrier-SW-65  Windows Software Support
Carrier-SW-82  Linux Software Support
Carrier-SW-95  QNX Software Support

For other operating systems please contact TEWS.
The TPCE260 is a standard height PCI Express Revision 1.1 compatible module that provides one slot for a single-width PMC module used to build modular, flexible and cost effective I/O solutions for all kinds of applications like process control, medical systems, telecommunication and traffic control.

The TPCE260 is a versatile solution to upgrade well known PMC I/O solutions to the PCI Express signalling standard.

The bridging between the PCI Express x1 link to the host board and the PCI bus signals to the PMC slot is handled by the transparent PCIe-to-PCI Bridge PI7C9X111SL from Pericom.

The PCI bus side of the bridge allows 32-bit PCI accesses with either 33 MHz or 66 MHz. Both 3.3V (TPCE260-x1R) and 5V (TPCE260-x0R) PCI I/O signalling voltages are supported.

The TPCE260 supports PMC front panel I/O and also PMC P14 Rear I/O through a VME P2 style connector (IEC 60603-2, Type C). The I/O mapping of P14 complies with VITA-35 ("PMC P4 to VME-P2, Rows A-C mapping").

The PCIe edge card connector provides +12V and +3.3V. All TPCE260-xx variants do use the +3.3V solely to power the PCIe-to-PCI Bridge.

The TPCE260-1xR uses the +12V of the PCIe edge card connector to generate all four power supply voltages for the PMC slot (+3.3V, +5V, +12V and -12V).

According to the PCIe specification, a PCIe x1 card is limited to 6W on the +12V which allows to operate most of the available 32-bit 33/66 MHz PMC modules on the TPCE260-1xR.

For increased power requirements of a PMC module, the TPCE260-2xR offer a PCIe Graphics Power Connector to supply the +12V for generating all the power supply voltages for the PMC slot providing a power of up to 25W.
**Technical Information**

- Form Factor: PCI Express x1, Revision 1.1
- Board size: 178.8mm x 107mm
- One PMC Slot:
  - PCI Interface: 33/66 MHz, 32-Bit
  - PCI I/O Signalling Voltage: 3.3V or 5V (factory build option)
  - PMC Front Panel I/O
  - PMC P14 I/O connected to VME P2 Style Connector (IEC 60603-2 compatible)
- All PMC Power Supplies generated from +12V
  - TPCE260-1xR: +12V from PCIe edge card connector
  - TPCE260-2xR: +12V from PCIe Graphics Power Connector
- Operating temperature: -40°C to +85°C
- MTBF (MIL-HDBK217F/FN2 GB 20°C):
  - TPCE260-1xR: 664000 h
  - TPCE260-2xR: 582000 h

**Order Information**

**RoHS Compliant**

**TPCE260-10R**
1 Slot PMC Carrier, 32 bit, 33/66 MHz, 5V PCI I/O signaling voltage, PCIe x1, 12V from PCIe connector

**TPCE260-11R**
1 Slot PMC Carrier, 32 bit, 33/66 MHz, 3.3V PCI I/O signaling voltage, PCIe x1, 12V from PCIe connector

**TPCE260-20R**
1 Slot PMC Carrier, 32 bit, 33/66 MHz, 5V PCI I/O signaling voltage, PCIe x1, 12V from PCIe Graphics connector

**TPCE260-21R**
1 Slot PMC Carrier, 32 bit, 33/66 MHz, 3.3V PCI I/O signaling voltage, PCIe x1, 12V from PCIe Graphics connector

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

**Documentation**

**TPCE260-DOC** User Manual

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The TPCE275 is a standard height PCI Express Revision 1.1 compatible module that provides one slot for a single-width XMC module used to build modular, flexible and cost effective I/O solutions for all kinds of applications like process control, medical systems, telecommunication and traffic control.

The TPCE275 is a versatile solution to upgrade well known XMC I/O solutions to the PCI Express signalling standard.

The PCI Express x1 link from the host board to the XMC module is enhanced by a PCIe Redriver, allowing safe operation of XMC modules on PCIe mainboards.

VPWR is selectable via order option. The TPCE275-0x0R variants provide for 12V VPWR and the TPCE275-3x1R order options provide 5V VPWR.

The TPCE275 supports XMC front panel I/O, and also P14 and P16 rear I/O independently.

XMC P16 rear I/O is provided through two 50-pin flat cable connectors mounted in a 2.54mm grid.

According to the PCIe specification, a PCIe x1 card is limited to 6W on the +12V which allows to operate many of the available XMC modules on the TPCE275-x1R. For increased power requirements of an XMC module, the TPCE275-x1R offer a PCIe Graphics Power Connector to supply the +12V for generating all the power supply voltages for the XMC slot (+3.3V, VPWR and +12V).

A 10-pin JTAG header is available for XMC module debugging purposes. All five JTAG signals are routed directly to the XMC slot.
**Technical Information**

- **Form Factor:** PCI Express x1, Revision 1.1
- **Board size:** approx. 200mm x 111mm
- **One XMC Slot:**
  - **PCIe Interface:** x1, Rev. 1.1
  - XMC Front Panel I/O
  - XMC P14 I/O connected to VME P2 Style Connector (IEC 60603-2 compatible)
  - XMC P16 I/O connected to two 50-pin flat cable connectors
- **All XMC Power Supplies generated from +12V**
  - TPCE275-1xR: +12V from PCIe edge card connector
  - TPCE275-2xR: +12V from PCIe Graphics Power Connector
- **JTAG:**
  - 10-pin header with all five JTAG signals routed to XMC connector
- **Operating temperature:** 0°C to +70°C
- **MTBF (MIL-HDBK217F/FN2 GB 20°C):**
  - TPCE275-10R: 664000h
  - TPCE275-11R: 664000h
  - TPCE275-20R: 637000h
  - TPCE275-21R: 637000h

**Order Information**

- **RoHS Compliant**
  - **TPCE275-10R**
    - 1 Slot XMC Carrier, PCIe x1, VPWR = 12V, 12V from PCIe connector
  - **TPCE275-11R**
    - 1 Slot XMC Carrier, PCIe x1, VPWR = 5V, 12V from PCIe connector
  - **TPCE275-20R**
    - 1 Slot XMC Carrier, PCIe x1, VPWR = 12V, 12V from PCIe Graphics connector
  - **TPCE275-21R**
    - 1 Slot XMC Carrier, PCIe x1, VPWR = 5V, 12V from PCIe Graphics connector

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

**Documentation**

- **TPCE275-DOC**
  - User Manual

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TPCE276     PCI Express x1, Gen2 XMC Carrier

Application Information

The TPCE276 is a standard height PCI Express Revision 2.0 compatible module that provides one slot for a single-width XMC module used to build modular, flexible and cost effective I/O solutions for all kinds of applications like process control, medical systems, telecommunication and traffic control.

The TPCE276 is a versatile solution to upgrade well known XMC I/O solutions to the PCI Express signalling standard.

The PCI Express x1 link from the host board to the XMC module is enhanced by a PCIe Gen2 Redriver, allowing safe operation of XMC modules on PCIe mainboards.

VPWR is selectable via order option. The TPCE276-x0R variants provide for 12V VPWR and the TPCE276-x1R order options provide 5V VPWR.

The TPCE276 supports XMC front panel I/O, and also P14 and P16 rear I/O independently.

XMC P14 rear I/O is provided through a Tyco AMPMODU System 50 0.050x0.100 flat ribbon cable connector. The I/O lines are routed differential.

XMC P16 rear I/O is implemented through two Samtec QTH-DP 0.50mm Q Pairs® High Speed Ground Plane Socket Strip, Differential Pair connector providing access to all P16 I/O lines.

The PCIe edge card connector provides +12V and +3.3V. The TPCE276-1xR uses the +12V of the PCIe edge card connector to generate all power supply voltages for the XMC slot (+3.3V, VPWR and +12V).

According to the PCIe specification, a PCIe x1 card is limited to 6W on the +12V which allows to operate many of the available XMC modules on the TPCE276-1xR.

For increased power requirements of an XMC module, the TPCE276-2xR offer a PCIe Graphics Power Connector to supply the +12V for generating all the power supply voltages for the XMC slot providing power of up to 25W.

A 10-pin JTAG header is available for XMC module debugging purposes. All five JTAG signals are routed directly to the XMC slot.
Technical Information

- Form Factor: PCI Express x1, Revision 2.0
- Board size: approx. 257mm x 111mm
- One XMC Slot:
  - PCIe Interface: x1, Rev. 2.0
  - XMC Front Panel I/O
  - XMC P14 I/O connected to Tyco AMPMODU System 50 0.050x0.100 connector
  - XMC P16 I/O connected to two Samtec QTH-DP 0.50mm Q Pairs® High Speed Ground Plane Socket Strip, Differential Pair connectors
- All XMC Power Supplies generated from +12V
  - TPCE276-1xR: +12V from PCIe edge card connector
  - TPCE276-2xR: +12V from PCIe Graphics Power Connector
- JTAG:
  - 10-pin header with all five JTAG signals routed to XMC connector
  - Operating temperature: -40°C to +85°C
  - MTBF (MIL-HDBK217F/FN2 G6 20°C):
    - TPCE276-10R: 603000h
    - TPCE276-11R: 603000h
    - TPCE276-20R: 535000h
    - TPCE276-21R: 535000h
- Operating temperature: -40°C to +85°C

Order Information

RoHS Compliant

TPCE276-10R  1 Slot XMC Carrier, PCIe x1, VPWR = 12V, 12V from PCIe connector
TPCE276-11R  1 Slot XMC Carrier, PCIe x1, VPWR = 5V, 12V from PCIe connector
TPCE276-20R  1 Slot XMC Carrier, PCIe x1, VPWR = 12V, 12V from PCIe Graphics connector
TPCE276-21R  1 Slot XMC Carrier, PCIe x1, VPWR = 5V, 12V from PCIe Graphics connector

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation

TPCE276-DOC  User Manual
**Application Information**

The TPCE277 is a standard height PCI Express Revision 3.0 compatible module that provides one slot for a single-width XMC module used to build modular, flexible and cost effective I/O solutions for all kinds of applications like process control, medical systems, telecommunication and traffic control.

The TPCE277 is a versatile solution to upgrade well known XMC I/O solutions to the PCI Express signalling standard.

The PCI Express x1 link from the host board to the XMC module is improved by a PCIe Gen3 Redriver, allowing safe operation of XMC modules on PCIe mainboards.

VPWR is selectable via order option. The TPCE277-x0R variants provide for 12V VPWR and the TPCE277-x1R order options provide 5V VPWR.

The TPCE277 supports XMC front panel I/O.

The PCIe edge card connector provides +12V and +3.3V. The TPCE277-1xR uses the +12V of the PCIe edge card connector to generate all power supply voltages for the XMC slot (+3.3V, VPWR and +12V). According to the PCIe specification, a PCIe x1 card is limited to 6W on the +12V which allows to operate many of the available XMC modules on the TPCE277-1xR.

For increased power requirements of an XMC module, the TPCE277-2xR offer a PCIe Graphics Power Connector to supply the +12V for generating all the power supply voltages for the XMC slot providing power of up to 25W.

A 10-pin JTAG header is available for XMC module debugging purposes. All five JTAG signals are routed directly to the XMC slot.
### Technical Information

- **Form Factor:** PCI Express x1, Revision 3.0
  - Board size: approx. 143mm x 111mm
- **One XMC Slot:**
  - PCIe Interface: x1, Rev. 3.0
  - XMC Front Panel I/O
- **All XMC Power Supplies generated from +12V**
  - TPCE277-1xR: +12V from PCIe edge card connector
  - TPCE277-2xR: +12V from PCIe Graphics Power Connector
- **JTAG:**
  - 10-pin header with all five JTAG signals routed to XMC connector
- **Operating temperature:** -40°C to +85°C
- **MTBF (MIL-HDBK217F/FN2 GB 20°C):**
  - TPCE277-10R: 1764000h
  - TPCE277-11R: 1631000h
  - TPCE277-20R: 1288000h
  - TPCE277-21R: 1216000h

### Order Information

**RoHS Compliant**

- **TPCE277-10R**
  1 Slot XMC Carrier, PCIe x1, VPWR = 12V, 12V from PCIe connector
- **TPCE277-11R**
  1 Slot XMC Carrier, PCIe x1, VPWR = 5V, 12V from PCIe connector
- **TPCE277-20R**
  1 Slot XMC Carrier, PCIe x1, VPWR = 12V, 12V from PCIe Graphics connector
- **TPCE277-21R**
  1 Slot XMC Carrier, PCIe x1, VPWR = 5V, 12V from PCIe Graphics connector

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

**Documentation**

- **TPCE277-DOC**
  User Manual

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Application Information

The TPCE278 is a standard height PCI Express Revision 3.0 compatible module that provides one slot for a single-width XMC module used to build modular, flexible and cost effective I/O solutions for all kinds of applications like process control, medical systems, telecommunication and traffic control.

The TPCE278 is a versatile solution to upgrade well known XMC I/O solutions to the PCI Express signalling standard.

The PCI Express x4 link from the host board to the XMC module is enhanced by a PCIe Gen3 Redriver, allowing safe operation of XMC modules on PCIe mainboards.

VPWR is selectable via order option. The TPCE278-x0R variants provide 12V VPWR and the TPCE278-x1R order options provide 5V VPWR.

The TPCE278 supports XMC front panel I/O, and also P14 and P16 rear I/O independently.

XMC P14 rear I/O is provided through a Tyco AMPMODU System 50 0.050x0.100 flat ribbon cable connector. The I/O lines are routed differentially.

XMC P16 rear I/O is implemented through two Samtec QTH-DP 0.50mm Q Pairs® High Speed Ground Plane Socket Strip, Differential Pair connector providing access to all P16 I/O lines.

The PCIe edge card connector provides +12V and +3.3V. The TPCE278-1xR uses the +12V of the PCIe edge card connector to generate all power supply voltages for the XMC slot (+3.3V, VPWR and +12V).

According to the PCIe specification, a PCIe x4 card is allowed to use 25W on the +12V which allows to operate most of the available XMC modules on the TPCE278-1xR. For increased power requirements of an XMC module, the TPCE278-2xR offer a PCIe Graphics Power Connector to supply the +12V for generating all the power supply voltages for the XMC slot providing power of up to 75W.

A 10-pin JTAG header is available for XMC module debugging purposes. All five JTAG signals are routed directly to the XMC slot.
Technical Information

- Form Factor: PCI Express x4, Revision 3.0
- Board size: approx. 257mm x 111mm
- One XMC Slot:
  - PCIe Interface: x4, Rev. 3.0
  - XMC Front Panel I/O
  - XMC P14 I/O connected to Tyco AMPMODU System 50 0.050x0.100 connector
  - XMC P16 I/O connected to two Samtec QTH-DP 0.50mm Q Pairs® High Speed Ground Plane Socket Strip, Differential Pair connectors
- All XMC Power Supplies generated from +12V
  - TPCE278-1xR: +12V from PCIe edge card connector
  - TPCE278-2xR: +12V from PCIe Graphics Power Connector
- JTAG:
  - 10-pin header with all five JTAG signals routed to XMC connector
- Operating temperature: -40°C to +85°C
- MTBF (MIL-HDBK217F/FN2 G6 20°C):
  - TPCE278-10R: 564000h
  - TPCE278-11R: 551000h
  - TPCE278-20R: 505000h
  - TPCE278-21R: 494000h

Order Information

RoHS Compliant
TPCE278-10R  1 Slot XMC Carrier, PCIe x4, VPWR = 12V, 12V from PCIe connector
TPCE278-11R  1 Slot XMC Carrier, PCIe x4, VPWR =  5V, 12V from PCIe connector
TPCE278-20R  1 Slot XMC Carrier, PCIe x4, VPWR = 12V, 12V from PCIe Graphics connector
TPCE278-21R  1 Slot XMC Carrier, PCIe x4, VPWR =  5V, 12V from PCIe Graphics connector

For the availability of non-RoHS compliant (leadend solder) products please contact TEWS.

Documentation
TPCE278-DOC  User Manual
TPCE001-TM VG64 I/O Transition Module

Application Information
The TPCE001-TM is a transition module to connect TEWS PCI(e) carriers with a VG64 I/O connector to TEWS PCI(e) carriers with a 68-pin AMPMODU flat cable connector, like TEWS’ TPCE276.

Technical Information
- 54 x 96mm sized PCB
- 1x DIN 41612 2.54mm, Right Angle Female, Type R Connector
- 1x Tyco 0.050 x 0.100 AMPMODU System 50 Connector
- Operating temperature: -40°C to +85°C

Order Information
RoHS Compliant
TPCE001-TM-10R VG64 I/O Transition Module

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TPCE001-TM-DOC User Manual

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Compact PCI Modules

As part of our continued commitment to the embedded I/O market, TEWS TECHNOLOGIES has expanded development of I/O solutions based on the CompactPCI standard.

The modules are designed for data communications, LAN/WAN networking, traffic control, simulation, telecommunication, and COTS applications. Our CompactPCI product line will offer comparable functionality to our PMC module product line.

If you wish to inquire about custom cPCI designs, please contact TEWS directly at our offices in Germany or the United States.

In addition to our well known cPCI modules, we offer a complete line of PMC, XMC, CompactPCI, PCI, PCI Express, PCI Express Mini Card, VMEbus, PC104+, AMC, MicroTCA, FMC, and numerous IndustryPack® modules off-the-shelf.

All TEWS modules feature a five-year limited warranty, and many are offered standard in extended temperature (-40°C to +85°C). Software drivers for VxWorks, Linux, QNX, Integrity and Windows are available. For more information go to www.tews.com.
Application Information

The TCP460 is a standard 3U 32 bit CompactPCI module and offers 16 channels of high performance asynchronous serial interface.

Five different standard modules are available: The TCP460-10R provides 16 RS232 interfaces. The TCP460-11R provides 16 RS422 interfaces. The TCP460-12R provides 8 RS232 and 8 RS422 interfaces. The TCP460-13R provides 12 RS232 and 4 RS422 interfaces. The TCP460-14R provides 4 RS232 and 12 RS422 interfaces. Other configurations are available as factory option on a per channel base.

All modules offer front panel I/O with a HD68 connector. The TCP460-2xR modules offer additional J2 rear I/O. Each RS232 channel supports RxD, TxD, RTS and CTS. Each RS422 supports RxD+/− and TxD+/−.

A transparent 32 bit / 66 MHz PCI-to-PCI Bridge provides access to the two Exar XR17D158 octal PCI-UARTs. The PCI-to-PCI Bridge allows 32 bit accesses on the local PCI bus and permits the high data throughput necessary for the high performance serial interfaces.

Each channel has 64 byte transmit and receive FIFOs to significantly reduce the overhead required to provide data to and get data from the transmitters and receivers. The FIFO trigger levels are programmable and the baud rate is individually programmable up to 921.6 kbps for RS232 channels and 5.5296 Mbps for RS422 channels. The UART offers readable FIFO levels.

Interrupts are supported. For fast interrupt source detection each octal UART provides a special Global Interrupt Source Register.

All serial channels use ESD protected transceivers up to ±15KV according to IEC 1000-4-2.

The TCP460 can operate with 3.3V and 5.0V PCI I/O signaling voltage.

Software Support (TDRV002-SW-xx) for different operating systems is available.
## Technical Information

- **Standard 3U 32 Bit CompactPCI module conforming to PICMG 2.0 R3.0**
- **Board size: 160 mm x 100 mm**
- **Asynchronous serial interface**
- **PCI-to-PCI Bridge**
  - PCI2050b
  - PCI I/O signaling voltage 5V and 3.3V
  - 32 bit / 66 MHz
- **UARTs:**
  - XR17D158 Octal UART (Exar)
  - PCI 2.2 compliant interface
  - 32 bit / 33 MHz
  - 64 byte transmit FIFO per channel
  - 64 byte receive FIFO per channel
- **Readable FIFO levels**
- **Global Interrupt Source Register**
- **General Purpose 16 bit Timer/Counter**
- **Support of RxD, TxD, RTS and CTS for each RS232 channel and RxD+/- and TxD+/- for each RS422 channel of the TCP460**
- **Programmable baud rates:**
  - RS232: up to 921.6 kbps
  - RS422: up to 5.5296 Mbps
- **ESD protected transceiver** (up to ± 15KV according to IEC 1000-4-2)
- **Operating temperature** -40° to +85°
Order Information

RoHS Compliant
TCP460-10R  16 Channel Serial RS232, HD68
TCP460-11R  16 Channel Serial RS422, HD68
TCP460-12R  8 Channel Serial RS232, 8 Channel Serial RS422, HD68
TCP460-13R  12 Channel Serial RS232, 4 Channel Serial RS422, HD68
TCP460-14R  4 Channel Serial RS232, 12 Channel Serial RS422, HD68
TCP460-20R  16 Channel Serial RS232, HD68 and J2 I/O
TCP460-21R  16 Channel Serial RS422, HD68 and J2 I/O
TCP460-22R  8 Channel Serial RS232, 8 Channel Serial RS422, HD68 and J2 I/O
TCP460-23R  12 Channel Serial RS232, 4 Channel Serial RS422, HD68 and J2 I/O
TCP460-24R  4 Channel Serial RS232, 12 Channel Serial RS422, HD68 and J2 I/O

Other configurations are available as factory option on a per channel base.

For the availability of non-RoHS compliant (lead solder) products please contact TEWS.

Documentation
TCP460-DOC  User Manual

Software
TDRV002-SW-25  Integrity Software Support
TDRV002-SW-42  VxWorks Software Support (Legacy and VxBus-Enabled Software Support)
TDRV002-SW-65  Windows Software Support
TDRV002-SW-82  Linux Software Support
TDRV002-SW-95  QNX Software Support

For other operating systems please contact TEWS.

Accessories
TA304  Cable Kit for Modules with HD68 Connector
TCP001-FP  6U Front Panel Extension for 3U cPCI Boards
The TCP461 is a standard 3U 32 bit CompactPCI module and offers 8 channels of high performance asynchronous serial interface.

Three different standard modules are available: The TCP461-x0R provides 8 RS232 interfaces. The TCP461-x1R provides 8 RS422 interfaces. The TCP461-x2R provides 4 RS232 and 4 RS422 interfaces.

Other configurations are available as factory build option on a per channel base.

All modules offer front panel I/O with a HD50 SCSI-2 type connector. The TCP461-2xR modules offer additional J2 rear I/O. Each RS232 channel supports RxD, TxD, RTS, CTS and GND. Each RS422 channel supports RxD+/-, TxD+/-, and GND.

Two channels of the TCP461-x0R/-x2R offer full modem support (TxD, RxD, CTS, RTS, DSR, DTR, CD, RI and GND) for RS232. Two channels of the TCP461-x1R support RxD+/-, TxD+/-, RTS+/-, and GND for RS422.

Each channel has 64 byte transmit and receive FIFOs to significantly reduce the overhead required to provide data to and get data from the transmitters and receivers. The FIFO trigger levels are programmable and the baud rate is individually programmable up to 921.6 kbps for RS232 channels and 5.5296 Mbps for RS422 channels. The UART offers readable FIFO levels.

All channels generate interrupts on CompactPCI interrupt INTA. For fast interrupt source detection the UART provides a special Global Interrupt Source Register.

All serial channels use ESD protected transceivers up to ±15KV.

The TCP461 can operate with 3.3V and 5.0V PCI I/O signaling voltage.

Software Support (TDRV002-SW-xx) for different operating systems is available.
Technical Information

- Standard 3U 32 Bit CompactPCI module conforming to PICMG 2.0 R3.0
- Target Chip: XR17D158 (Exar)
- PCI 2.3 compliant interface
- PCI I/O signaling voltage 5V and 3.3V
- Board size: 160 mm x 100 mm
- Asynchronous serial interface
- Octal UART: Exar XR17D158
- Support of RxD, TxD, RTS, CTS and GND for each RS232 channel; RxD+/-, TxD+/- and GND for each RS422 channel. Two channels offer extended support (full modem or RTS+/− and CTS+/−)
- Programmable baud rates:
  - RS232: up to 921.6 kbps
  - RS422: up to 5.5296 Mbps
- 64 byte transmit FIFO per channel
- 64 byte receive FIFO per channel
- Readable FIFO levels
- Global Interrupt Source Register
- General Purpose 16 bit Timer/Counter
- ESD protected transceiver (up to ± 15KV)
- Operating temperature -40°C to +85°C
Order Information

RoHS Compliant
TCP461-10R  8 Channel Serial RS232, HD50
TCP461-11R  8 Channel Serial RS422, HD50
TCP461-12R  4 Channel Serial RS232, 4 Channel Serial RS422, HD50
TCP461-20R  8 Channel Serial RS232, HD50 and J2 I/O
TCP461-21R  8 Channel Serial RS422, HD50 and J2 I/O
TCP461-22R  4 Channel Serial RS232, 4 Channel Serial RS422, HD50 and J2 I/O

Other configurations are available as factory option on a per channel base.

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TCP461-DOC  User Manual

Software
TDRV002-SW-25  Integrity Software Support
TDRV002-SW-42  VxWorks Software Support (Legacy and VxBus-Enabled Software Support)
TDRV002-SW-65  Windows Software Support
TDRV002-SW-82  Linux Software Support
TDRV002-SW-95  QNX Software Support

For other operating systems please contact TEWS.

Accessories
TA301  Cable Kit for Modules with HD50 Connector
TCP001-FP  6U Front Panel Extension for 3U cPCI Boards
**TCP462  4 Channel Serial Interface RS232/RS422**

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**Application Information**

The TCP462 is a standard 3U 32 bit CompactPCI module and offers 4 channels of high performance asynchronous serial interface.

Three different standard modules are available: The TCP462-10R provides 4 RS232 interfaces. The TCP462-11R provides 4 RS422 interfaces. The TCP462-12R provides 2 RS232 and 2 RS422 interfaces.

Other configurations are available as factory build option on a per channel base.

All modules offer front panel I/O with a HD50 SCSI-2 type connector. The TCP462-2xR modules offer additional J2 rear I/O. Each RS232 channel supports RxD, TxD, RTS, CTS and GND. Each RS422 channel supports RxD+/-, TxD+/- and GND. One channel of the TCP462-x0R/-x2R offers full modem support (TxD, RxD, CTS, RTS, DSR, DTR, CD, RI and GND) for RS232. One channel of the TCP462-x1R supports RxD+/-, TxD+/-, RTS+/-, CTS+/- and GND for RS422.

Each channel has 64 byte transmit and receive FIFOs to significantly reduce the overhead required to provide data to and get data from the transmitters and receivers. The FIFO trigger levels are programmable and the baud rate is individually programmable up to 921.6 kbps for RS232 channels and 5.5296 Mbps for RS422 channels. The UART offers readable FIFO levels.

All channels generate interrupts on CompactPCI interrupt INTA. For fast interrupt source detection the UART provides a special Global Interrupt Source Register.

All serial channels use ESD protected transceivers up to ±15KV.

The TCP462 can operate with 3.3V and 5.0V PCI I/O signaling voltage.

Software Support (TDRV002-SW-xx) for different operating systems is available.

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## Technical Information

- Standard 3U 32 Bit CompactPCI module conforming to PICMG 2.0 R3.0
- Target Chip: XR17D154 (Exar)
- PCI 2.3 compliant interface
- PCI I/O signaling voltage 5V and 3.3V
- Board size: 160 mm x 100 mm
- Asynchronous serial interface
- Quad UART: Exar XR17D154
- Support of RxD, TxD, RTS, CTS and GND for each RS232 channel; RxD+/-, TxD+/- and GND for each RS422 channel. One channel offers extended support (full modem or RTS+/- and CTS+/-)
- Programmable baud rates:
  - RS232: up to 921.6 kbps
  - RS422: up to 5.5296 Mbps
- 64 byte transmit FIFO per channel
- 64 byte receive FIFO per channel
- Readable FIFO levels
- Global Interrupt Source Register
- General Purpose 16 bit Timer/Counter
- ESD protected transceiver (up to ± 15KV)
- Operating temperature -40°C to +85°C
**Order Information**

**RoHS Compliant**
- TCP462-10R  4 Channel Serial RS232, HD50
- TCP462-11R  4 Channel Serial RS422, HD50
- TCP462-12R  2 Channel Serial RS232, 2 Channel Serial RS422, HD50
- TCP462-20R  4 Channel Serial RS232, HD50 and J2 I/O
- TCP462-21R  4 Channel Serial RS422, HD50 and J2 I/O
- TCP462-22R  2 Channel Serial RS232, 2 Channel Serial RS422, HD50 and J2 I/O

Other configurations are available as factory option on a per channel base.

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

**Documentation**
- TCP462-DOC User Manual

**Software**
- TDRV002-SW-25 Integrity Software Support
- TDRV002-SW-42 VxWorks Software Support (Legacy and VxBus-Enabled Software Support)
- TDRV002-SW-65 Windows Software Support
- TDRV002-SW-82 Linux Software Support
- TDRV002-SW-95 QNX Software Support

For other operating systems please contact TEWS.

**Accessories**
- TA301 Cable Kit for Modules with HD50 Connector
- TCP001-FP  6U Front Panel Extension for 3U cPCI Boards

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TCP463  4 Channel Serial Interface RS232/RS422

Application Information

The TCP463 is a standard 3U 32 bit CompactPCI module and offers 4 channels of high performance asynchronous serial interface.

Three different standard modules are available: The TCP463-10R provides 4 RS232 interfaces. The TCP463-11R provides 4 RS422 interfaces. The TCP463-12R provides 2 RS232 and 2 RS422 interfaces. Other configurations are available as factory build option on a per channel base.

All modules offer front panel I/O with four RJ45 connectors. The TCP463-2xR modules offer additional J2 rear I/O. Each RS232 channel supports TxD, RxD, CTS, RTS, DTR, CD, and GND. Each RS422 channel supports RxD+/-, TxD+/-, and GND on front and RxD+/-, TxD+/-, RTS+/-, CTS+/- and GND on rear I/O.

Each channel has 64 byte transmit and receive FIFOs to significantly reduce the overhead required to provide data to and get data from the transmitters and receivers. The FIFO trigger levels are programmable and the baud rate is individually programmable up to 921.6 kbps for RS232 channels and 5.5296 Mbps for RS422 channels. The UART offers readable FIFO levels.

All channels generate interrupts on CompactPCI interrupt INTA. For fast interrupt source detection the UART provides a special Global Interrupt Source Register.

All serial channels use ESD protected transceivers up to ±15KV.

The TCP463 can operate with 3.3V and 5.0V PCI I/O signaling voltage.

Software Support (TDRV002-SW-xx) for different operating systems is available.
## Technical Information

- Standard 3U 32 Bit CompactPCI module conforming to PICMG 2.0 R3.0
- Target Chip: XR17D154 (Exar)
- PCI 2.3 compliant interface
- PCI I/O signaling voltage 5V and 3.3V
- Board size: 160 mm x 100 mm
- Asynchronous serial interface
- Quad UART: Exar XR17D154
- Support of RxD, TxD, RTS, CTS, DTR, DCD, DSR/RI and GND for each RS232 channel; RxD+/-, TxD+/-, and GND on front and RxD+/-, TxD+/-, RTS+/-, CTS+/- and GND on rear I/O for each RS422 channel.
- Programmable baud rates:
  - RS232: up to 921.6 kbps
  - RS422: up to 5.5296 Mbps
- 64 byte transmit FIFO per channel
- 64 byte receive FIFO per channel
- Readable FIFO levels
- Global Interrupt Source Register
- General Purpose 16 bit Timer/Counter
- ESD protected transceiver (up to ± 15KV)
- Operating temperature -40°C to +85°C

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**Diagram:**

![Diagram](image)
Order Information

RoHS Compliant
TCP463-10R  4 Channel Serial RS232, RJ45
TCP463-11R  4 Channel Serial RS422, RJ45
TCP463-12R  2 Channel Serial RS232, 2 Channel Serial RS422, RJ45
TCP463-20R  4 Channel Serial RS232, RJ45 and J2 I/O
TCP463-21R  4 Channel Serial RS422, RJ45 and J2 I/O
TCP463-22R  2 Channel Serial RS232, 2 Channel Serial RS422, RJ45 and J2 I/O

Other configurations are available as factory option on a per channel base.

For the availability of non-RoHS compliant (lead solders) products please contact TEWS.

Documentation
TCP463-DOC  User Manual

Software
TDRV002-SW-25  Integrity Software Support
TDRV002-SW-42  VxWorks Software Support (Legacy and VxBus-Enabled Software Support)
TDRV002-SW-65  Windows Software Support
TDRV002-SW-82  Linux Software Support
TDRV002-SW-95  QNX Software Support

For other operating systems please contact TEWS.

Accessories
TCP001-FP  6U Front Panel Extension for 3U cPCI Boards
TCP465  8 Channel RS232/RS422/RS485 Programmable Serial Interface

Application Information

The TCP465 is a standard 3U 32 bit CompactPCI module and offers 8 channels of high performance RS232/RS422/RS485 programmable asynchronous serial interface. The module offers front panel I/O with a HD50 SCSI-2 type connector. The TCP465-20R module offers additional J2 rear I/O.

The serial channels can be individually programmed to operate as RS232, RS422 or RS485 full duplex/half duplex interface. In addition programmable termination is provided for the RS422/RS485 interfaces. After power-up all serial I/O lines are in a high impedance state.

Each RS232 channel supports RxD, TxD, RTS, CTS and GND. RS422 and RS485 full duplex support a four wire interface (RX+, RX-, TX+, TX-) plus ground (GND). RS485 half duplex supports a two wire interface (DX+, DX-) plus ground (GND).

Each channel has 64 byte transmit and receive FIFOs to significantly reduce the overhead required to provide data to and get data from the transmitters and receivers. The FIFO trigger levels are programmable and the baud rate is individually programmable up to 921.6 kbps for RS232 channels and 5.5296 Mbps for RS422/RS485 channels. The UART offers readable FIFO levels.

All channels generate interrupts on CompactPCI interrupt INTA. For fast interrupt source detection the UART provides a special Global Interrupt Source Register.

All serial channels use ESD protected transceivers up to ±15KV.

The TCP465 can operate with 3.3V and 5.0V PCI I/O signaling voltage.

Software Support (TDRV002-SW-xx) for different operating systems is available.
Technical Information

- Standard 3U 32 bit CompactPCI module conforming to PICMG 2.0 R3.0
- Target Chip: XR17D158 (Exar)
- PCI 2.3 compliant interface
- PCI I/O signaling voltage 5V and 3.3V
- Board size: 160 mm x 100 mm
- Asynchronous serial interface
- Octal UART: Exar XR17D158
- Programmable Interfaces:
  - RS232
  - RS422
  - RS485 Full Duplex
  - RS485 Half Duplex
  - Programmable Termination for RS422/RS485
- Support of RxD, TxD, RTS, CTS and GND for each RS232 channel; RxD+/-, TxD+/- and GND for each RS422/RS485 FD channel; D+/- and GND for each RS485 HD channel.
- Programmable baud rates:
  - RS232: up to 921.6 kbps
  - RS422/RS485: up to 5.5296 Mbps
- 64 byte transmit FIFO per channel
- 64 byte receive FIFO per channel
- Readable FIFO levels
- Global Interrupt Source Register
- General Purpose 16 bit Timer/Counter
- ESD protected transceiver (up to ± 15KV)
- Operating temperature -40°C to +85°C
Order Information

RoHS Compliant
TCP465-10R 8 Channel Programmable RS232/RS422/RS485, HD50
TCP465-20R 8 Channel Programmable RS232/RS422/RS485, HD50 and J2 I/O

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TCP465-DOC User Manual

Software
TDRV002-SW-25 Integrity Software Support
TDRV002-SW-42 VxWorks Software Support (Legacy and VxBus-Enabled Software Support)
TDRV002-SW-65 Windows Software Support
TDRV002-SW-82 Linux Software Support
TDRV002-SW-95 QNX Software Support

For other operating systems please contact TEWS.

Accessories
TA301 Cable Kit for Modules with HD50 Connector
TCP001-FP 6U Front Panel Extension for 3U cPCI Boards
TCP466 4 Channel RS232/RS422/RS485 Programmable Serial Interface

Application Information

The TCP466 is a standard 3U 32 bit CompactPCI module and offers 4 channels of high performance RS232/RS422/RS485 programmable asynchronous serial interface. The module offers front panel I/O with a HD50 SCSI-2 type connector. The TCP466-20R module offers additional J2 rear I/O.

The serial channels can be individually programmed to operate as RS232, RS422 or RS485 full duplex/half duplex interface. In addition programmable termination is provided for the RS422/RS485 interfaces. After power-up all serial I/O lines are in a high impedance state.

Each RS232 channel supports RxD, TxD, RTS, CTS and GND. RS224 and RS485 full duplex support a four wire interface (RX+, RX-, TX+, TX-) plus ground (GND). RS485 half duplex supports a two wire interface (DX+, DX-) plus ground (GND).

Each channel has 64 byte transmit and receive FIFOs to significantly reduce the overhead required to provide data to and get data from the transmitters and receivers. The FIFO trigger levels are programmable and the baud rate is individually programmable up to 921.6 kbps for RS232 channels and 5.5296 Mbps for RS422/RS485 channels. The UART offers readable FIFO levels.

All channels generate interrupts on CompactPCI interrupt INTA. For fast interrupt source detection the UART provides a special Global Interrupt Source Register.

All serial channels use ESD protected transceivers up to ±15KV.

The TCP466 can operate with 3.3V and 5.0V PCI I/O signaling voltage.

Software Support (TDRV002-SW-xx) for different operating systems is available.
Technical Information

- Standard 3U 32 bit CompactPCI module conforming to PICMG 2.0 R3.0
- Target Chip: XR17D154 (Exar)
- PCI 2.3 compliant interface
- PCI I/O signaling voltage 5V and 3.3V
- Board size: 160 mm x 100 mm
- Asynchronous serial interface
- Quad UART: Exar XR17D154
- Programmable Interfaces:
  - RS232
  - RS422
  - RS485 Full Duplex
  - RS485 Half Duplex
  - Programmable Termination for RS422/RS485
- Support of RxD, TxD, RTS, CTS and GND for each RS232 channel; RxD+/-, TxD+/- and GND for each RS422/RS485 FD channel; D+/- and GND for each RS485 HD channel.
- Programmable baud rates:
  - RS232: up to 921.6 kbps
  - RS422/RS485: up to 5.5296 Mbps
- 64 byte transmit FIFO per channel
- 64 byte receive FIFO per channel
- Readable FIFO levels
- Global Interrupt Source Register
- General Purpose 16 bit Timer/Counter
- ESD protected transceiver (up to ± 15KV)
- Operating temperature -40°C to +85°C
Order Information
RoHS Compliant
TCP466-10R 4 Channel Programmable RS232/RS422/RS485, HD50
TCP466-20R 4 Channel Programmable RS232/RS422/RS485, HD50 and J2 I/O
For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TCP466-DOC User Manual

Software
TDRV002-SW-25 Integrity Software Support
TDRV002-SW-42 VxWorks Software Support (Legacy and VxBus-Enabled Software Support)
TDRV002-SW-65 Windows Software Support
TDRV002-SW-82 Linux Software Support
TDRV002-SW-95 QNX Software Support
For other operating systems please contact TEWS.

Accessories
TA301 Cable Kit for Modules with HD50 Connector
TCP001-FP 6U Front Panel Extension for 3U cPCI Boards
The TCP467 is a standard 3U 32 bit CompactPCI module and offers 4 channels of high performance RS232/RS422/RS485 programmable asynchronous serial interface. The module offers front panel I/O with four RJ45 type connectors. The TCP467-10R provides a RJ45 I/O pinout according to EIA-232D. The TCP467-11R provides a non-standard RJ45 I/O pinout (as used on Motorola CPU boards).

The serial channels can be individually programmed to operate as RS232, RS422 or RS485 full duplex/half duplex interface. In addition programmable termination is provided for the RS422/RS485 interfaces. After power-up all serial I/O lines are in a high impedance state.

Each RS232 channel supports RxD, TxD, RTS, CTS and GND. RS422 and RS485 full duplex support a four wire interface (RX+, RX-, TX+, TX-) plus ground (GND). RS485 half duplex supports a two wire interface (DX+, DX-) plus ground (GND).

Each channel has 64 byte transmit and receive FIFOs to significantly reduce the overhead required to provide data to and get data from the transmitters and receivers. The FIFO trigger levels are programmable and the baud rate is individually programmable up to 921.6 kbps for RS232 channels and 5.5296 Mbps for RS422/RS485 channels. The UART offers readable FIFO levels.

All channels generate interrupts on CompactPCI interrupt INTA. For fast interrupt source detection the UART provides a special Global Interrupt Source Register.

All serial channels use ESD protected transceivers up to ±15KV.

The TCP467 can operate with 3.3V and 5.0V PCI I/O signaling voltage.

Software Support (TDRV002-SW-xx) for different operating systems is available.
## Technical Information

- Standard 3U 32 bit CompactPCI module conforming to PICMG 2.0 R3.0
- Target Chip: XR17D154 (Exar)
- PCI 2.3 compliant interface
- PCI I/O signaling voltage 5V and 3.3V
- Board size: 160 mm x 100 mm
- Asynchronous serial interface
- Quad UART: Exar XR17D154
- Programmable Interfaces:
  - RS232
  - RS422
  - RS485 Full Duplex
  - RS485 Half Duplex
  - Programmable Termination for RS422/RS485
- Support of RxD, TxD, RTS, CTS and GND for each RS232 channel; RxD+/-, TxD+/- and GND for each RS422/RS485 FD channel; D+/- and GND for each RS485 HD channel.
- Programmable baud rates:
  - RS232: up to 921.6 kbps
  - RS422/RS485: up to 5.5296 Mbps
- 64 byte transmit FIFO per channel
- 64 byte receive FIFO per channel
- Readable FIFO levels
- Global Interrupt Source Register
- General Purpose 16 bit Timer/Counter
- ESD protected transceiver (up to ± 15KV)
- Operating temperature -40°C to +85°C
Order Information

RoHS Compliant
TCP467-10R  4 Channel Programmable RS232/RS422/RS485, RJ45
TCP467-11R  4 Channel Programmable RS232/RS422/RS485, RJ45 (Motorola compatible pinout)

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TCP467-DOC  User Manual

Software
TDRV002-SW-25  Integrity Software Support
TDRV002-SW-42  VxWorks Software Support (Legacy and VxBus-Enabled Software Support)
TDRV002-SW-65  Windows Software Support
TDRV002-SW-82  Linux Software Support
TDRV002-SW-95  QNX Software Support

For other operating systems please contact TEWS.

Accessories
TCP001-FP  6U Front Panel Extension for 3U cPCI Boards
TCP468  4 Channel Serial Interface RS422

Application Information
The TCP468 is a standard 3U 32 bit CompactPCI module and offers 4 channels of high performance RS 422 serial interface.

The module is based on the Exar XR17D154 universal PCI UART.

The module offers front panel I/O with a DB-50 type connector. Each channel provides nearly full modem support by the following signals: RxD±, TxD±, RTS±, CTS±, DCD± and DTR±.

On-board termination is provided for all output signals.
Each channel has 64 byte transmit and receive FIFOs to significantly reduce the overhead required to provide data to and get data from the transmitters and receivers. The FIFO trigger levels are programmable and the baud rate is individually programmable up to 5.5296 Mbps. The UART offers readable FIFO levels.

All channels generate interrupts on PCI interrupt INTA. For fast interrupt source detection the UART provides a special Global Interrupt Source Register.

All serial channels use ESD protected transceivers. ESD protection is up to ±15KV.

The TCP468 can operate with 3.3V and 5.0V PCI I/O signaling voltage.
Software Support (TDRV002-SW-xx) for different operating systems is available.
Technical Information

- Standard 3U 32 Bit CompactPCI module conforming to PICMG 2.0 R3.0
- Target Chip: XR17D154 (Exar)
- PCI 2.3 compliant interface
- PCI I/O signaling voltage 5V and 3.3V
- Board size: 160 mm x 100 mm
- Asynchronous serial interface
- Quad UART: Exar XR17D154
  - Support of RxD±, TxD±, RTS±, CTS±, DTR±, DCD± for each channel
- Programmable baud rates:
  - RS422: up to 5.5296 Mbps
- 64 byte transmit FIFO per channel
- 64 byte receive FIFO per channel
- Readable FIFO levels
- Global Interrupt Source Register
- General Purpose 16 bit Timer/Counter
- ESD protected transceiver (up to ± 15KV)
- Operating temperature -40°C to +85°C

Order Information

RoHS Compliant
TCP468-10R 4 Channel Serial Interface, RS422, DB-50 Front-I/O

Other configurations are available as factory option on a per channel base.

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TCP468-DOC User Manual

Software
TDRV002-SW-25 Integrity Software Support
TDRV002-SW-42 VxWorks Software Support (Legacy and VxBus-Enabled Software Support)
TDRV002-SW-65 Windows Software Support
TDRV002-SW-82 Linux Software Support
TDRV002-SW-95 QNX Software Support

For other operating systems please contact TEWS.

Accessories
TCP001-FP 6U Front Panel Extension for 3U cPCI Boards

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Issue 1.0.1
2017-08-24
TCP469  8 Channel Isolated RS323/RS422/RS485
Programmable Serial Interface

Application Information

The TCP469 is a standard 3U 32 bit CompactPCI module and offers 8 channels of high performance serial interface. The module offers front panel I/O with a HD50 SCSI-2 type connector. Each of the eight channels is isolated from the system and against each other by digital isolator and on board integrated DC/DC converter. A 4 channel variant is realized as a special assembly called TCP470.

The TCP469 module is based on the Exar XR17D158 universal PCI octal UART.

Each serial channel can be programmed via a CPLD register to operate as an RS232, RS422 or RS485 interface. The RS422 and RS485 interfaces can be programmed as Full Duplex or Half Duplex interface with programmable termination.

Each RS232 channel supports RxD, TxD, RTS, CTS and GND. RS422 and RS485 Full Duplex support a four wire interface (RX+, RX-, TX+, TX-) plus ground (GND). Half Duplex supports a two wire interface (DX+, DX-) plus ground (GND).

Each channel has 64 byte transmit and receive FIFOs to significantly reduce the overhead required to provide data to and get data from the transmitters and receivers. The FIFO trigger levels are programmable and the baud rate is individually programmable up to 921.6 kbps for RS232 channels and 5.5296 Mbps for RS422/RS485 channels. The UART offers readable FIFO levels.

All channels generate interrupts on PCI interrupt INTA. For fast interrupt source detection the UART provides a special Global Interrupt Source Register.

All serial channels use ESD protected programmable multiprotocol transceivers. ESD protection is up to ±15KV.

All Modules can operate with 3.3V and 5.0V PCI I/O signalling voltage.

Software Support (TDRV002-SW-xx) for different operating systems is available.
Technical Information

- Standard 3U 32 bit CompactPCI module conforming to PICMG 2.0 R3.0
- Target Chip: XR17D158 (Exar)
- PCI 2.3 compliant interface
- PCI I/O signaling voltage 5V and 3.3V
- Board size: 160 mm x 100 mm
- Asynchronous serial interface
- Octal UART: Exar XR17D158
- Programmable Interfaces:
  - RS232
  - RS422
  - RS485 Full Duplex
  - RS485 Half Duplex
  - Programmable Termination for RS422/RS485
- Support of RxD, TxD, RTS, CTS and GND for each RS232 channel; RxD+/-, TxD+/- and GND for each RS422/RS485 FD channel; D+/- and GND for each RS485 HD channel.
- Programmable baud rates:
  - RS232: up to 921.6 kbps
  - RS422/RS485: up to 5.5296 Mbps
- 64 byte transmit FIFO per channel
- 64 byte receive FIFO per channel
- Readable FIFO levels
- Global Interrupt Source Register
- General Purpose 16 bit Timer/Counter
- Galvanic isolation of each Transceiver Channel
- ESD protected transceiver (up to ± 15KV)
- Operating temperature -40°C to +85°C
- MTBF (MIL-HDBK217F/FN2 G0 20°C) TCP469-10R: 578000h

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Issue 1.0.1
2017-08-24
### Order Information

**RoHS Compliant**
TCP469-10R     8 Channel Isolated Programmable RS232/RS422/RS485, HD50

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

**Documentation**
TCP469-DOC     User Manual

**Software**
TDRV002-SW-25  Integrity Software Support
TDRV002-SW-42  VxWorks Software Support (Legacy and VxBus-Enabled Software Support)
TDRV002-SW-65  Windows Software Support
TDRV002-SW-82  Linux Software Support
TDRV002-SW-95  QNX Software Support

For other operating systems please contact TEWS.

**Accessories**
TA301          Cable Kit for Modules with HD50 Connector
TCP001-FP      6U Front Panel Extension for 3U cPCI Boards
Application Information

The TCP470 is a standard 3U 32 bit CompactPCI module and offers 4 channels of high performance serial interface. The module offers front panel I/O with a HD50 SCSI-2 type connector. Each of the eight channels is isolated from the system and against each other by digital isolator and on board integrated DC/DC converter. A 8 channel variant is realized as a special assembly called TCP469.

The TCP470 module is based on the Exar XR17D154 universal PCI quad UART.

Each serial channel can be programmed via a CPLD register to operate as an RS232, RS422 or RS485 interface. The RS422 and RS485 interfaces can be programmed as Full Duplex or Half Duplex interface with programmable termination.

Each RS232 channel supports RxD, TxD, RTS, CTS and GND. RS422 and RS485 Full Duplex support a four wire interface (RX+, RX-, TX+, TX-) plus ground (GND). Half Duplex supports a two wire interface (DX+, DX-) plus ground (GND).

Each channel has 64 byte transmit and receive FIFOs to significantly reduce the overhead required to provide data to and get data from the transmitters and receivers. The FIFO trigger levels are programmable and the baud rate is individually programmable up to 921.6 kbps for RS232 channels and 5.5296 Mbps for RS422/RS485 channels. The UART offers readable FIFO levels.

All channels generate interrupts on PCI interrupt INTA. For fast interrupt source detection the UART provides a special Global Interrupt Source Register.

All serial channels use ESD protected programmable multiprotocol transceivers. ESD protection is up to ±15KV.

All Modules can operate with 3.3V and 5.0V PCI I/O signalling voltage.

Software Support (TDRV002-SW-xx) for different operating systems is available.

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issue 1.0.1 2017-08-24
**Technical Information**

- Standard 3U 32 bit CompactPCI module conforming to PICMG 2.0 R3.0
- Target Chip: XR17D154 (Exar)
- PCI 2.3 compliant interface
- PCI I/O signaling voltage 5V and 3.3V
- Board size: 160 mm x 100 mm
- Asynchronous serial interface
- Quad UART: Exar XR17D154
- Programmable Interfaces:
  - RS232
  - RS422
  - RS485 Full Duplex
  - RS485 Half Duplex
  - Programmable Termination for RS422/RS485

- Support of RxD, TxD, RTS, CTS and GND for each RS232 channel; RxD+/-, TxD+/- and GND for each RS422/RS485 FD channel; D+/- and GND for each RS485 HD channel.
- Programmable baud rates:
  - RS232: up to 921.6 kbps
  - RS422/RS485: up to 5.5296 Mbps
- 64 byte transmit FIFO per channel
- 64 byte receive FIFO per channel
- Readable FIFO levels
- Global Interrupt Source Register
- General Purpose 16 bit Timer/Counter
- Galvanic isolation of each Transceiver Channel
- ESD protected transceiver (up to ± 15KV)
- Operating temperature -40°C to +85°C
- MTBF (MIL-HDBK217F/FN2 Gb 20°C): 756000h

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![Diagram of the module](Image)
Order Information

RoHS Compliant
TCP470-10R 4 Channel Isolated Programmable RS232/RS422/RS485, HD50
For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TCP470-DOC User Manual

Software
TDRV002-SW-25 Integrity Software Support
TDRV002-SW-42 VxWorks Software Support (Legacy and VxBus-Enabled Software Support)
TDRV002-SW-65 Windows Software Support
TDRV002-SW-82 Linux Software Support
TDRV002-SW-95 QNX Software Support
For other operating systems please contact TEWS.

Accessories
TA301 Cable Kit for Modules with HD50 Connector
TCP001-FP 6U Front Panel Extension for 3U cPCI Boards

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Issue 1.0.1 2017-08-24
Application Information

The TCP631 is a standard 3U 32 bit CompactPCI module providing a user configurable FPGA with 1,500,000 or 5,000,000 system gates. All local signals from the PCI controller are routed to the FPGA.

The TCP631 offers 64 I/O lines to the front I/O and 64 I/O lines to the rear I/O. For flexible front I/O solutions the TCP631 provides a PIM Module slot, allowing active and passive signal conditioning. An option offers additionally 64 I/O lines via the J2 connector. All I/O lines are directly connected to the FPGA-pins, which maintains the flexibility of the Select I/O technology of the Spartan III FPGA. All I/O lines provide external ESD-protection devices. In addition the FPGA is connected to two banks of 128 Mbytes, 16 bit wide DDR2 SDRAM.

The FPGA is configured by a parallel flash. The flash device is in-system programmable via driver software over the PCI bus. An in-circuit debugging option is available via an optionally mountable JTAG header for readback and real-time debugging of the FPGA design (using Xilinx “ChipScope”).

A programmable clock generator supplies up to four different clock frequencies between 5 kHz and 200 MHz which are available at the FPGA, in addition one clock source is used as the local clock signal for the PCI controller. The clock generator settings are stored in an EEPROM and can be changed by the driver software.

The configuration EEPROM of the PCI controller can also be modified by the driver software, to adapt address spaces etc.

User applications for the TCP631-x0R can be developed using the design software ISE WebPACK which can be downloaded free of charge from www.xilinx.com. User applications for the TCP631-x1R require the full ISE Foundation software, which must be purchased from Xilinx.
Technical Information

- Form Factor: Standard 3U 32 bit CompactPCI module conforming to PICMG 2.0 R3.0
- Board size: 160 mm x 100 mm
- 32 bit PCI master interface by PLX PCI9056
- PCI 2.2 compliant interface
- 3.3V and 5V PCI Signaling Voltage
- Xilinx XC3S1500-4 Spartan-III or Xilinx XC3S5000-4 Spartan-III FPGA
- Flash device in-system programmable

- FPGA clock options:
  - Local clock oscillator
  - PLL programmable clock generator (5 KHz – 200 MHz), four clock outputs connected to FPGA
- 2x 128 Mbytes DDR2 RAM
- I/O access:
  - 64 I/O lines via a PIM Module slot,
  - 64 I/O lines on rear connector J2
- Operating temperature -40°C to +85°C
## Order Information

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCP631-10R</td>
<td>Reconfigurable FPGA, Direct Connect to PIM Slot, PCI9056, XC3S1500-4, 2 x 128MB DDR2</td>
</tr>
<tr>
<td>TCP631-11R</td>
<td>Reconfigurable FPGA, Direct Connect to PIM Slot, PCI9056, XC3S5000-4, 2 x 128MB DDR2</td>
</tr>
<tr>
<td>TCP631-20R</td>
<td>Reconfigurable FPGA, Direct Connect to PIM Slot, PCI9056, XC3S1500-4, 2 x 128MB DDR2, J2 I/O</td>
</tr>
<tr>
<td>TCP631-21R</td>
<td>Reconfigurable FPGA, Direct Connect to PIM Slot, PCI9056, XC3S5000-4, 2 x 128MB DDR2, J2 I/O</td>
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</tbody>
</table>

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

### Documentation

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>TCP631-DOC</td>
<td>User Manual</td>
</tr>
<tr>
<td>TCP631-ED</td>
<td>Engineering Documentation for TCP631: includes TCP631-DOC; schematics; data sheets; VHDL example code</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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<tbody>
<tr>
<td>TDRV014-SW-25</td>
<td>Integrity Software Support</td>
</tr>
<tr>
<td>TDRV014-SW-42</td>
<td>VxWorks Software Support (Legacy and VxBus-Enabled Software Support)</td>
</tr>
<tr>
<td>TDRV014-SW-65</td>
<td>Windows Software Support</td>
</tr>
<tr>
<td>TDRV014-SW-82</td>
<td>Linux Software Support</td>
</tr>
<tr>
<td>TDRV014-SW-95</td>
<td>QNX Software Support</td>
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</table>

For other operating systems please contact TEWS.

### Related Products

<table>
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<tr>
<th>Model</th>
<th>Description</th>
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<tbody>
<tr>
<td>TPIM003</td>
<td>PIM I/O Module, HD68 connector, special pin assignment</td>
</tr>
<tr>
<td>TCP001-FP</td>
<td>6U front panel extension for 3U cPCI boards</td>
</tr>
</tbody>
</table>
TCP863 4 Channel High Speed Synch/Asynch Serial Interface

Application Information

The TCP863 is a standard 3U 32 bit CompactPCI module with four high speed serial data communication channels.

The TCP863 is the successor of the discontinued TCP862, providing similar functionality and full connector and pin-out compatibility.

The TCP863-10R provides front panel I/O via HD68 SCSI-3 type connector and TCP863-20R additionally provides rear I/O via J2.

The serial communication controller is implemented in FPGA logic, along with the bus master capable PCI interface, guaranteeing long term availability and having the option to implement additional functions in the future.

Each channel provides dedicated receive and transmit FIFOs for high data throughput.

Data transfer on the PCI bus is handled via TCP863 initiated DMA cycles with minimum host/CPU intervention.

Several serial communication protocols are supported by each channel, such as asynchronous, isochronous, synchronous and HDLC mode.

A 14.7456 MHz oscillator provides standard asynchronous baud rates. An additional 24 MHz oscillator is provided for other baud rates. A 10 MHz oscillator is used for the synchronous baud rate of 10 Mbit/s.

Each channel also provides various interrupt sources, generated on INTA. The interrupt sources can be enabled or disabled individually.

Multiprotocol transceivers are used for the line interface. The physical interface is selectable by software, individually for each channel as EIA-232, EIA-422, EIA-449, EIA-530, EIA-530A, V.35, V.36 or X.21.

The following signals are provided by the TCP863 for each channel at the front and rear I/O connectors: Receive Data (RxD +/-), Transmit Data (TxD +/-), Receive Clock (RxCl +/-), Transmit Clock (TxCl +/-), Ready-To-Send (RTS +/-), Clear-To-Send (CTS +/-), Carrier-Detect (CD +/-) and GND. Additionally serial channel 3 provides Data-Set-Ready (DSR3 +/-) and Data-Terminal-Ready (DTR3 +/-) at the front I/O connector.

Driver support (TDRV009-SW-xx) for different operating systems is available.

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The Embedded I/O Company

Technical Information

- Standard 3U 32 Bit CompactPCI module conforming to PICMG 2.0 R3.0
- PCI 2.1 compliant master/slave interface
- 3.3V and 5V PCI Signaling Voltage
- Board size: 160 mm x 100 mm
- Four high speed synchronous/asynchronous serial interfaces
- Support of RxD, TxD, RxC, TxC, RTS, CTS, CD and GND on HD68 front connector, parallel to rear connector J2 (TCP863-20R); DTR3 and DSR3 only at front I/O
- Physical interface (individually programmable per channel): EIA-232, EIA-422, EIA-449, EIA-530, EIA-530A, V.35, V.36 and X.21
- Maximum data rate: 10 Mbit/s (synchronous), 2 Mbit/s (asynchronous), internal or external provided clock
- EIA-232: up to 115.2 kbit/s
- Operating temperature range: -40°C to +85°C

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Order Information

RoHS Compliant
TCP863-10R 4 Ch. High Speed Synch/Asynch Serial Interface, HD68
TCP863-20R 4 Ch. High Speed Synch/Asynch Serial Interface, HD68 and J2 I/O)

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TCP863-DOC User Manual

Software
TDRV009-SW-25 Integrity Software Support
TDRV009-SW-42 VxWorks Software Support (Legacy and VxBus-Enabled Software Support)
TDRV009-SW-65 Windows Software Support
TDRV009-SW-82 Linux Software Support
TDRV009-SW-95 QNX Software Support

For other operating systems please contact TEWS.

Related Products
TA304 Cable Kit for Modules with HD68 Connector
TCP001-FP 6U front panel extension for 3U cPCI boards
Application Information

The TCP260 is a standard 6U CompactPCI carrier that provides front I/O and rear I/O for up to two single width PMC modules.

The transparent PCI to PCI Bridge is used as the PCI bridging device between the primary CompactPCI bus and the on board secondary PCI bus where the two PMC slots reside.

Supported PCI bus data widths are 32 bit and 64 bit. Supported PCI bus frequencies are 33 MHz and 66 MHz.

The TCP260 supports standard PMC front I/O and CompactPCI rear I/O. The PMC slot 1 I/O lines are connected directly to the CompactPCI connector J3. The PMC slot 2 I/O lines are connected directly to the CompactPCI connector J5.

The TCP260 also provides hot swapping capability. The TCP260 on board hot swap controller controls the installation and reinstallation process of the TCP260 without powering down the CompactPCI system.

The TCP260 carrier complies with the PICMG 2.0 Revision 3.0 CompactPCI specification.

The TCP260 is available in extended temperature range as TCP260-10R-ET and TCP260-11R-ET.

Technical Information

- Standard 6U 32/64 bit CompactPCI module conforming to PICMG 2.0 R3.0
- PCI 2.2 compliant interface
- Two PMC sites conforming to PMC standard
- Board size: 160 mm x 233.35 mm
- Front panel I/O
- CompactPCI rear I/O : Connector J3 and J5
- PCI Interface : 33 / 66 MHz; 32 / 64 bit
- PCI-to-PCI bridge Pericom PI7C8154
- CompactPCI hot swap conforming to PICMG 2.1 R2.0
- 5V and 3.3V signaling
- Temperature range: 0°C to +70°C (TCP260-10R/-11R) and -40°C to +85°C (TCP260-10R-ET/-11R-ET)
**Order Information**

**RoHS Compliant**

TCP260-10R 6U Dual PMC Carrier, J3/J5 I/O, 5V PMC I/O signaling voltage
TCP260-10R-ET 6U Dual PMC Carrier, J3/J5 I/O, 5V PMC I/O signaling voltage, ext. temp.
TCP260-11R 6U Dual PMC Carrier, J3/J5 I/O, 3.3V PMC I/O signaling voltage
TCP260-11R-ET 6U Dual PMC Carrier, J3/J5 I/O, 3.3V PMC I/O signaling voltage, ext. temp.

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

**Documentation**

TCP260-DOC User Manual

**Related Products**

TCP2020-TM 6U Transition Module, RJ3/RJ5, 2 PIM Slot
Application Information

The TCP261 is a standard 6U CompactPCI carrier that provides front I/O and rear I/O for up to two single width PMC modules.

32 bit and 64 bit PCI accesses are supported on PCI bus with PCI frequency 33 MHz and also 66 MHz. The transparent PCI-to-PCI bridge provides the real connection between primary CompactPCI bus and the two secondary PMC slots. The bridge controls all PCI accesses, data bus width and in each case the frequency for a PMC access to one of the connected modules.

The TCP261 supports standard PMC front I/O and for both PMC slots CompactPCI rear I/O. The PMC slot 2 is connected directly to the CompactPCI connector J4 and J3. The PMC slot 1 is connected directly to the CompactPCI connector J3.

Capability of hot swapping is realized by a hot swap controller for the TCP261. The hot swap controller and the PCI-to-PCI Bridge are controlling the installation and reinstallation process of the TCP261 without power down the system.

The TCP261 carrier complies with the PICMG 2.0 Revision 3.0 CompactPCI specification.

Technical Information

- Standard 6U 32/64 bit CompactPCI module conforming to PICMG 2.0 R3.0
- PCI 2.2 compliant interface
- Two PMC sites conforming to PMC standard
- Board size: 160 mm x 233.35 mm
- Front panel I/O
- CompactPCI rear I/O: Connector J3 and J4 conforming to PICMG 2.3 R1.0
- PCI Interface: 33/66 MHz; 32/64 bit
- PCI-to-PCI bridge Pericom PI7C8154
- CompactPCI hot swap conforming to PICMG 2.1 R2.0
- 5V and 3.3V signaling
- Operating temperature 0°C to +70°C (TCP261-10R/-11R) and -40°C to +85°C (TCP261-10R-ET/-11R-ET)
Order Information

RoHS Compliant
TCP261-10R  6U Dual PMC Carrier, J3/J4 I/O, 5V PMC I/O signaling voltage
TCP261-10R-ET  6U Dual PMC Carrier, J3/J4 I/O, 5V PMC I/O signaling voltage, ext. temp.
TCP261-11R  6U Dual PMC Carrier, J3/J4 I/O, 3.3V PMC I/O signaling voltage
TCP261-11R-ET  6U Dual PMC Carrier, J3/J4 I/O, 3.3V PMC I/O signaling voltage, ext. temp.

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TCP261-DOC  User Manual

Related Products
TCP021-TM  6U Transition Module, RJ3/RJ4, 2 PIM Slot

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Issue 1.0.1  2017-08-24
TCP270  PMC Carrier for 3U CompactPCI

Application Information

The TCP270 is a standard 3U CompactPCI carrier that provides front I/O and rear I/O for a single width PMC module. This PMC to 3U CompactPCI adapter is used to build modular, flexible and cost effective I/O solutions with PMC devices in CompactPCI systems.

32 bit / 33 MHz accesses are supported on the PCI bus. The TCP270 is used as a mechanical adaptor to connect a standard PMC module in 3U CompactPCI systems.

The TCP270 supports PMC front I/O and optional CompactPCI rear I/O at CompactPCI connector J2/P2. The pin assignment corresponds to the PICMG 2.3 R1.0 PMC on CompactPCI signal mapping.

The use of PMC I/O on the J2/P2 connector (TCP270-11) precludes the use of 64 bit CompactPCI backplanes.

The TCP270 carrier complies with the PICMG 2.0 Revision 3.0 CompactPCI specification.

Operating temperature range is -40°C to +85°C.

Technical Information

- 3U 32 bit / 33 MHz CompactPCI module conforming to PICMG 2.0 Rev 3.0
- PCI 2.2 compliant interface
- Board size: 160 mm x 100 mm
- PCI Interface: 33 MHz; 32 bit
- 5V and 3.3V PCI I/O signaling voltage possible

- One PMC site conforming to PMC standard
- Front panel I/O
- CompactPCI rear I/O: Connector J2 optional
- Operating temperature -40°C to +85°C

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Order Information

RoHS Compliant
TCP270-10R  3U 1 Slot Passive PMC Carrier, 32bit/33Mhz, PMC front I/O
TCP270-11R  3U 1 Slot Passive PMC Carrier, 32bit/33Mhz, PMC front I/O and rear I/O on J2

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TCP270-DOC  User Manual

Related Products
TCP030-TM   3U Transition Module for 1 slot PMC Carrier, HD68 connector
TCP040-TM   3U Transition Module for 1 slot PMC Carrier, 1 PIM slot
TCP001-FP   6U Front Panel Extension for 3U cPCI Boards
Application Information

The TCP201 is a standard 6U CompactPCI Carrier with front I/O for up to four single-size or two double-size IndustryPack (IP) modules used to build modular, flexible and cost effective I/O solutions for applications in process control, medical systems, telecommunication and traffic control.

For improved EMI protection, four HD50 SCSI-2 type connectors are mounted in the EMI front panel of the TCP201 and provide access to all IP I/O lines. Status indicators for IP access, +5V and +/-12V are provided in the front panel.

The TCP201 can operate with 3.3V and 5.0V PCI I/O signaling voltage.

All IP interrupt request lines are mapped to PCI INTA. For fast interrupt source detection, the TCP201 provides a special IP interrupt status register.

The IP power lines are fuse protected by self healing fuses and RF filtered. The operating temperature range is -40°C to +85°C.

The TCP201 complies with the PICMG 2.0 Revision 3.0 CompactPCI specification.

Technical Information

- Standard 6U 32 bit CompactPCI module conforming to PICMG 2.0 Rev 3.0
- PCI 2.2 compliant interface
- Board size: 160mm x 233.35mm
- PCI Interface: 33 MHz; 32 bit
- 5V and 3.3V PCI I/O signaling voltage
- ANSI/VITA 4-1995 compliant interface to IndustryPack modules
- IndustryPack slots: Four single-size or two double-size
- 8/32 MHz interface, no DMA
- 8 MByte memory space per IP
- Routing of all IP interrupts to PCI INTA, local interrupt status register
- I/O access: HD50 SCSI-2 type connector per IP, front panel I/O
- Status LED’s
  - ACK LED for each IP module
  - +5V Power LED for each IP slot
  - +12V and −12V Power LED
- Self Healing fuses and RF-filtering on all IP power lines
- Operating temperature -40°C to +85°C

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Order Information

RoHS Compliant
TCP201-10R 6U 4 Slot IndustryPack Carrier, HD50 connectors

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TCP201-DOC User Manual

Software
CARRIER-SW-42 VxWorks IP Carrier Software Support (Legacy and VxBus-enabled Software Support)
CARRIER-SW-65 Windows IP Carrier Software Support
CARRIER-SW-82 Linux IP Carrier Software Support
CARRIER-SW-95 QNX IP Carrier Software Support

For other operating systems please contact TEWS.

Related Products
TA301 Cable Kit for Modules with HD50 Connector

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TCP211 CompactPCI Carrier for 2 IndustryPacks®

Application Information
The TCP211 is a standard 3U CompactPCI carrier for up to two single-size or one double-size IndustryPack (IP) modules used to build modular, flexible and cost effective I/O solutions for applications in process control, medical systems, telecommunication and traffic control.

Access to all IP I/O lines is provided by two 50 pin 0.1 inch flat ribbon cable connectors mounted in the front panel.

The TCP211 can operate with 3.3V and 5.0V PCI I/O signaling voltage.

All IP interrupt request lines are mapped to PCI INTA. For fast interrupt source detection, the TCP211 provides a special IP interrupt status register.

The IP power lines are fuse protected by self healing fuses and RF filtered. The operating temperature range is -40°C to +85°C.

The TCP211 complies with the PICMG 2.0 Revision 3.0 CompactPCI specification.

Technical Information
- Standard 3U 32 bit CompactPCI module conforming to PICMG 2.0 Rev 3.0
- PCI 2.2 compliant interface
- Board size: 160mm x 100mm
- PCI Interface : 33 MHz; 32 bit
- 5V and 3.3V PCI I/O signaling voltage
- ANSI/VITA 4-1995 compliant interface to IndustryPack modules
- IndustryPack slots: Two single-size or one double-size
- 8/32 MHz interface, no DMA
- 8 MByte memory space per IP
- Routing of all IP interrupts to PCI INTA, local interrupt status register
- I/O access: 50 pin 0.1 inch flat ribbon cable connector per IP mounted in front panel
- Self healing fuses and RF-filtering on all IP power lines
- Operating temperature -40°C to +85°C
Order Information

RoHS Compliant
TCP211-10R 3U 2 Slot IndustryPack Carrier, 50 pin ribbon cable connector (stacked version)
For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TCP211-DOC User Manual

Software
CARRIER-SW-42 VxWorks IP Carrier Software Support (Legacy and VxBus-enabled Software Support)
CARRIER-SW-65 Windows IP Carrier Software Support
CARRIER-SW-82 Linux IP Carrier Software Support
CARRIER-SW-95 QNX IP Carrier Software Support
For other operating systems please contact TEWS.

Related Products
TA305 Cable Kit for Modules with 50 pin Ribbon Cable Connector
TCP001-FP 6U Front Panel Extension for 3U cPCI Boards
TCP213 CompactPCI Carrier for 2 IndustryPacks®

Application Information
The TCP213 is a standard 3U CompactPCI carrier that provides back I/O for up to two single-size or one double-size IndustryPack (IP) modules. It is used to build modular, flexible and cost effective I/O solutions for applications in process control, medical systems, telecommunication and traffic control.

Access to all IP I/O lines is provided via J2. Status indicators for IP access, +5V and +/-12V are provided in the front panel.

The TCP213 can operate with 3.3V and 5.0V PCI I/O signaling voltage.

All IP interrupt request lines are mapped to PCI INTA. For fast interrupt source detection, the TCP213 provides a special IP interrupt status register.

The IP power lines are fuse protected by self healing fuses and RF filtered. The operating temperature range is -40°C to +85°C.

The TCP213 complies with the PICMG 2.0 Revision 3.0 CompactPCI specification.

Technical Information
- 3U 32 bit CompactPCI module conforming to PICMG 2.0 Rev 3.0
- PCI 2.2 compliant interface
- Board size: 160mm x 100mm
- PCI Interface : 33 MHz; 32 bit
- 5V and 3.3V PCI I/O signaling voltage
- ANSI/VITA 4-1995 compliant interface to IndustryPack modules
- IndustryPack slots: Two single-size or one double-size
- 8/32 MHz interface, no DMA
- 8 MByte memory space per IP
- Routing of all IP Interrupts to PCI INTA, local interrupt status register
- I/O access via J2
- Status LED’s
- ACK LED for each IP module
- +5V Power LED for each IP slot
- +12V and −12V Power LED
- Self Healing fuses and RF-filtering on all IP power lines
- Operating temperature -40°C to +85°C
Order Information

RoHS Compliant
TCP213-10R  3U 2 Slot IndustryPack Carrier, rear I/O on J2
For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TCP213-DOC  User Manual

Software
CARRIER-SW-42  VxWorks IP Carrier Software Support (Legacy and VxBus-enabled Software Support)
CARRIER-SW-65  Windows IP Carrier Software Support
CARRIER-SW-82  Linux IP Carrier Software Support
CARRIER-SW-95  QNX IP Carrier Software Support
For other operating systems please contact TEWS.

Related Products
TCP010-TM  3U Transition Module for IndustryPack Carrier, 50pin ribbon cable connectors (rack internal)
TCP011-TM  3U Transition Module for IndustryPack Carrier, 50pin ribbon cable connectors (stacked version)
TCP001-FP  6U Front Panel Extension for 3U cPCI Boards

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The TCP220 a standard 6U CompactPCI Carrier provides back I/O for up to four single-size or two double-size IndustryPack (IP) modules used to build modular, flexible and cost effective I/O solutions for applications in control, medical systems, telecommunication and traffic control.

Access to all IP I/O lines is provided by a PICMG 2.4 R1.0 compliant I/O mapping via J4 and J5. Status indicators for IP access, +5V and +/-12V are provided in the front panel.

The TCP220 can operate with 3.3V and 5.0V PCI I/O signaling voltage.

All IP interrupt request lines are mapped to PCI INTA. For fast interrupt source detection, the TCP220 provides a special IP interrupt status register.

The IP power lines are fuse protected by self healing fuses and RF filtered. The operating temperature range is -40°C to +85°C.

The TCP220 complies with the PICMG 2.0 Revision 3.0 CompactPCI specification.

Application Information

Technical Information

- Standard 6U 32Bit CompactPCI module conforming to PICMG 2.0 Rev 3.0
- PCI 2.2 compliant interface
- Board size: 160mm x 233.35mm
- PCI Interface : 33 MHz; 32 bit
- 5V and 3.3V PCI I/O signaling voltage
- ANSI/VITA 4-1995 compliant interface to IndustryPack modules
- IndustryPack slots: Four single-size or two double-size
- 8/32 MHz interface, no DMA
- 8 MByte memory space per IP

- Routing of all IP interrupts to PCI INTA, local interrupt status register
- I/O access: PICMG 2.4 R1.0 compliant via J4, J5
- Status LED’s
- ACK LED for each IP module
- +5V Power LED for each IP slot
- +12V and −12V Power LED
- Self Healing fuses and RF-filtering on all IP power lines
- Operating temperature -40°C to +85°C

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Order Information

RoHS Compliant
TCP220-10R  6U 4 Slot IndustryPack Carrier, rear I/O on J4/J5
For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TCP220-DOC  User Manual

Software
CARRIER-SW-42  VxWorks IP Carrier Software Support (Legacy and VxBus-enabled Software Support)
CARRIER-SW-65  Windows IP Carrier Software Support
CARRIER-SW-82  Linux IP Carrier Software Support
CARRIER-SW-95  QNX IP Carrier Software Support
For other operating systems please contact TEWS.

Related Products
TCP001-TM  6U Transition Module for IndustryPack Carrier, 50pin ribbon cable connectors (rack internal)
TCP002-TM  6U Transition Module for IndustryPack Carrier, HD50 connectors
TCP001-TM  Transition Module for 6U cPCI IP Carrier

Application Information
The TCP001-TM is a Transition Module to be used with 6U cPCI IP carrier, providing easy access to the IP I/O lines of cPCI IP carrier with back I/O.

It distributes all 200 IP I/O lines from the cPCI RJ4 and RJ5 connector to four 50 pin ribbon cable connectors allowing easy rack internal wiring.

The routing between the cPCI RJ4 and RJ5 connector and the four ribbon cable connectors is PICMG 2.4 R1.0 compliant.

The TCP001-TM has no front panel. The operating temperature range is -40°C to +85°C.

Technical Information
- Form Factor: cPCI Rear Transition Module
- I/O Routing:
  - PICMG 2.4 R1.0 compliant I/O mapping (RJ4 and RJ5)
  - I/O lines are accessible via four 50 pin ribbon cable connectors
- No front panel
- Operating temperature: -40°C to +85°C

Order Information
RoHS Compliant
TCP001-TM-10R  6U Transition Module for IndustryPack Carrier, 50pin ribbon cable connectors (rack internal)

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TCP001-TM-DOC  User Manual
TCP002-TM  Transition Module for 6U cPCI IP Carrier

Application Information
The TCP002-TM is a 6U Transition Module to be used with 6U cPCI IP carrier, providing easy access to the IP I/O lines of cPCI IP carrier with back I/O.
It distributes all 200 IP I/O lines from the cPCI RJ4 and RJ5 connector to four 50 pin SCSI-2 type connectors located in the EMI front panel.
The routing between the cPCI RJ4 and RJ5 connector and the four SCSI-2 type connectors in the EMI front panel is PCIMG 2.4 R1.0 compliant.
The operating temperature range is -40°C to +85°C.

Technical Information
- Form Factor: cPCI 6U Rear Transition Module (233mm x 80mm)
- I/O Routing:
  - PICMG 2.4 R1.0 compliant I/O mapping (RJ4 and RJ5)
  - I/O lines are accessible via four HD50 SCSI-2 type connectors
- EMI front panel
- Operating temperature: -40°C to +85°C

Order Information
RoHS Compliant
TCP002-TM-10R  6U Transition Module for IndustryPack Carrier, HD50 connectors

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TCP010-TM  Transition Module for 3U cPCI IP Carrier

**Application Information**

The TCP010-TM is a Transition Module to be used with 3U cPCI IP carrier, providing easy access to the IP I/O lines of cPCI IP carrier with back I/O.

It distributes all 100 IP I/O lines from the cPCI RJ2 connector to two 50 pin ribbon cable connectors allowing easy rack internal wiring.

The TCP010-TM has no front panel.

The operating temperature range is -40°C to +85°C.

**Technical Information**

- Form Factor: cPCI 3U Rear Transition Module
- I/O Routing:
  - I/O lines are accessible via two 50 pin ribbon cable connectors
- No front panel
- Operating temperature: -40°C to +85°C

**RoHS Compliant**

TCP010-TM-10R  3U Transition Module for IndustryPack Carrier, 50pin ribbon cable connectors (rack internal)

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

**Documentation**

TCP010-TM-DOC  User Manual
The TCP011-TM is a 3U Transition Module to be used with 3U cPCI IP carrier, providing easy access to the IP I/O lines of cPCI IP carrier with back I/O.

It distributes all 100 IP I/O lines from the cPCI RJ2 connector to two 50 pin ribbon cable connectors (stacked version) located in the front panel.

The operating temperature range is -40°C to +85°C.

Technical Information
- Form Factor: cPCI 3U Rear Transition Module (100mm x 80mm)
- I/O Routing:
  - I/O lines are accessible via two 50 pin ribbon cable connectors
  - Front panel
- Operating temperature: -40°C to +85°C

Order Information
RoHS Compliant
TCP011-TM-10R  3U Transition Module for IndustryPack Carrier, 50pin ribbon cable connectors (stacked version)

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
The Embedded I/O Company

TCP020-TM  PIM Carrier Transition Module for 6U cPCI

Application Information
The TCP020-TM is a 6U PIM Carrier Transition Module to be used with 6U cPCI PMC carrier like TEWS’ TCP260. It provides easy access to the PMC I/O lines of cPCI PMC carrier with back I/O via J3 and J5.

The PIM Carrier TCP020-TM distributes all I/O lines of both PMCs from the cPCI RJ3 and RJ5 connector to two PIM modules.

The operating temperature range is -40°C to +85°C.

Technical Information
- Form Factor: cPCI 6U Rear Transition Module (233 mm x 80 mm)
- I/O Routing:
  - PMC I/O mapping via RJ3 and RJ5
  - I/O lines are accessible via two PIM modules
- EMI front panel
- Operating temperature: -40°C to +85°C

Order Information
RoHS Compliant
TCP020-TM-10R  6U Transition Module, RJ3/RJ5, 2 PIM Slot

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation

Related Products
TPIM001  PIM I/O Module, HD50 connector
TPIM002  PIM I/O Module, HD68 connector
TPIM003  PIM I/O Module, HD68 connector, special pin assignment
TPIM005  PIM I/O Module, HD68 connector, for TPMC863/TPMC363
TPIM006  PIM I/O Module for Quad 10/100/1000 Ethernet PMC

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The TCP021-TM is a 6U PIM Carrier Transition Module to be used with 6U cPCI PMC carrier like TEWS' TCP261. It provides easy access to the PMC I/O lines of cPCI PMC carrier with back I/O via J3 and J4.
The PIM Carrier TCP021-TM distributes all I/O lines of both PMCs from the cPCI RJ3 and RJ4 connector to two PIM modules.
The operating temperature range is -40°C to +85°C.

**Technical Information**
- Form Factor: cPCI 6U Rear Transition Module (233 mm x 80 mm)
- I/O Routing:
  - PMC I/O mapping via RJ3 and RJ4
  - I/O lines are accessible via two PIM modules
- EMI front panel
- Operating temperature: -40°C to +85°C

**Order Information**
- RoHS Compliant
- TCP021-TM-10R 6U Transition Module, RJ3/RJ4, 2 PIM Slot

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

**Documentation**

**Related Products**
- TPIM001 PIM I/O Module, HD50 connector
- TPIM002 PIM I/O Module, HD68 connector
- TPIM003 PIM I/O Module, HD68 connector, special pin assignment
- TPIM005 PIM I/O Module, HD68 connector, for TPMC863/TPMC363
- TPIM006 PIM I/O Module for Quad 10/100/1000 Ethernet PMC

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The TCP030-TM is a 3U Transition Module to be used with 3U cPCI PMC carrier like TEWS’ TCP270-11R. It provides easy access to the PMC I/O lines of cPCI PMC carrier with back I/O. All 64 PMC I/O lines are distributed from the cPCI RJ2 connector to a 68 pin SCSI-3 type connector located in the front panel. The pin assignment corresponds to the PICMG 2.3 R1.0 PMC on CompactPCI signal mapping. The operating temperature range is -40°C to +85°C.

### Technical Information
- **Form Factor:** cPCI 3U Rear Transition Module (100 mm x 80 mm)
- **I/O Routing:**
  - I/O lines are accessible via HD68 SCSI-3 type connector
- **Front panel**
- **Operating temperature:** -40°C to +85°C

### Order Information
**RoHS Compliant**
- **TCP030-TM-10R** 3U Transition Module for 1 slot PMC Carrier, HD68 connector

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

**Documentation**
- **TCP030-TM-DOC** User Manual

**Related Products**
- **TPIM001** PIM I/O Module, HD50 connector
- **TPIM002** PIM I/O Module, HD68 connector
- **TPIM003** PIM I/O Module, HD68 connector, special pin assignment
- **TPIM005** PIM I/O Module, HD68 connector, for TPMC863/TPMC363
- **TPIM006** PIM I/O Module for Quad 10/100/1000 Ethernet PMC
Application Information

The TCP040-TM is a 3U PIM Carrier Transition Module to be used with 3U CompactPCI PMC carrier like TEWS' TCP270 or 3U CompactPCI modules with back I/O. It provides easy access to the PMC I/O lines of 3HE CompactPCI PMC carriers and most TEWS CompactPCI Modules with back I/O.

It distributes all I/O lines of one PMC from the cPCI RJ2 connector to a PIM module.

The operating temperature range is -40°C to +85°C.

Technical Information

- Form Factor: cPCI 3U Rear Transition Module (100 mm x 80 mm)
- I/O Routing:
  - PMC I/O mapping via RJ2
  - I/O lines are accessible via the PIM modules
  - EMI front panel
  - Operating temperature: -40°C to +85°C

Order Information

RoHS Compliant
TCP040-TM-10R 3U Transition Module for 1 slot PMC Carrier, 1 PIM slot

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TCP040-TM-DOC User Manual

Related Products
TPIM001 PIM I/O Module, HD50 connector
TPIM002 PIM I/O Module, HD68 connector
TPIM003 PIM I/O Module, HD68 connector, special pin assignment
TPIM005 PIM I/O Module, HD68 connector, for TPMC863/TPMC363
TPIM006 PIM I/O Module for Quad 10/100/1000 Ethernet PMC

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PCI Express Mini Card Modules

With the background and long-term experience in interface products based on IndustryPack, PMC, XMC, CompactPCI, PCI, PCI Express, VMEbus, PC104+, AMC, MicroTCA, and FMC industrial standards, TEWS TECHNOLOGIES is applying its expertise to the introduction of PCI Express Mini Card modules.

If you wish to inquire about custom PCI Express Mini Card designs, please contact TEWS directly at our offices in Germany or the United States. TEWS works closely with OEM and government customers to deliver accelerated time to market, long-term product availability and comprehensive product lifecycle management -- from the design stage through manufacturing, testing and beyond to post-sales support.
TMPE627 Reconfigurable FPGA with AD/DA & Digital I/O
PCIe Mini Card

Application Information
The TMPE627 is a standard full PCI Express Mini Card, providing a user programmable Xilinx Artix-7 7A50T FPGA.

The TMPE627 provides 14 ESD-protected 5 V-tolerant TTL lines. All I/O lines are individually programmable as input or output. TTL I/O lines can be set to high, low, or tristate. Each TTL I/O line has a pull-resistor to a common programmable pull-up voltage that can be set so +3.3 V, +5 V and GND.

The 16 bit ADC offers 4 input channels that can be software configured to operate in single-ended or differential mode. It offers software selectable input voltage ranges of 0-5.12 V, 0-10 V, 0-10.24 V, ±5 V, ±5.12 V, ±10 V and ±10.24 V with a sampling rate of up to 200 ksp/s.

The DAC offers 4 channels of 16 bit analog outputs with software selectable output voltage ranges of 0-5 V, 0-10 V, 0-10.8 V, ±5 V, ±10 V or ±10.8 V. The output voltage range can be individually set per channel. The conversion time is typ. 10 μs and the DAC outputs are capable to drive a load of 2 kΩ, with a capacitance up to 4000 pF.

Each TMPE627 is factory calibrated. The calibration information is stored in an on-board serial EEPROM unique to each TMPE627 module.

The I/O signals are accessible through a 30 pin Pico-Clasp latching connector.

The User FPGA is configured by a SPI flash. An in-circuit debugging option is available via a JTAG header for read back and real-time debugging of the FPGA design (using the Vivado ILA). With the TA308 Programming Kit direct JTAG access to the FPGA is possible, using the Xilinx Platform Cable USB.

User applications for the TMPE627 with 7A50T FPGA can be developed using the design software Vivado Design Suite HL WebPACK Edition, which can be downloaded free of charge from www.xilinx.com.

TEWS offers a well-documented basic FPGA Example Application design. It includes a constraints file with all necessary pin assignments and basic timing constraints. The example design covers the main functionalities of the TMPE627. It implements PCIe to register mapping and basic I/O. It comes as a Xilinx Vivado Design Suite project with source code and as a ready-to-download bit stream.

TMPE627-10R

TA308

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Issue 1.0.3 2018-01-25
**Technical Information**

- Form Factor: Full-Mini Card
- Board size: 50.95 mm x 30 mm
- PCI Express 1.1 compliant interface
- Artix-7 User programmable FPGA
- TMPE627-10R: Xilinx XC7A50T-2
- PCIe endpoint in FPGA
- 128 Mbit SPI-EEPROM for FPGA configuration and User Data
- Digital I/O
  - 14 ESD-protected 5 V-tolerant TTL lines with programmable pull-resistor
  - Direction individually programmable
- 4 channels 16 bit analog input
  - Simultaneous sampling
  - True differential inputs
  - Programmable input voltage (one setting for all channels):
    - 0-5.12 V, 0-10 V, 0-10.24 V,
    - ±5 V, ±5.12 V, ±10 V, ±10.24 V
  - Sampling rate: 200 kSPS
  - Overvoltage protection
  - Factory calibration
- 4 channels single-ended 16 bit isolated analog output
  - Simultaneous update
  - Programmable output voltage:
    - 0-5 V, 0-10 V, 0-10.8 V,
    - ±5 V, ±10 V, ±10.8 V
  - Conversion time: typ. 10 μs
  - Up to 2 kΩ resistive, 4000 pF capacitive load
  - Overcurrent protection
  - Factory calibration
- I/O access
  - 30 pin Pico-Clasp latching connector
- MTBF (MIL-HDBK217F/FN2 GB 20°C)
  - TMPE627: 987,000 h

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**TMPE627 Block Diagram**

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Issue 1.0.3 2018-01-25
Order Information

RoHS Compliant
TMPE627-10R  14 TTL I/O, 4 AD, 4 DA, Artix-7 7A50T FPGA

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TMPE627-DOC  User Manual

Software
TDRV020-SW-25  Integrity Software Support
TDRV020-SW-42  VxWorks Software Support (Legacy and VxBus-Enabled Software Support)
TDRV020-SW-65  Windows Software Support
TDRV020-SW-82  Linux Software Support
TDRV020-SW-95  QNX Software Support

For other operating systems please contact TEWS.

Related Products
TA308  Cable Kit for Modules with XRS JTAG Connector
TA309  Cable Kit for Modules with Pico-Clasp Connector
Application Information

The TMPE633 is a standard full PCI Express Mini Card, providing a user programmable Xilinx Spartan-6 LX25T FPGA.

The TMPE633-10R provides 26 ESD-protected 5V-tolerant TTL lines, the TMPE633-11R provides 13 differential I/O lines using EIA 422 / EIA 485 compatible, ESD-protected line transceivers and the TMPE633-12R provides 13 differential I/O lines using Multipoint-LVDS Transceiver.

All I/O lines are individually programmable as input or output. TTL I/O lines can be set to high, low, or tri-state. Each TTL I/O line has a pull-resistor to a common programmable pull voltage that can be set so +3.3 V, +5 V and GND. Differential I/O lines are terminated, RS-485 lines with 120 Ω, M-LVDS lines with 100 Ω.

The I/O signals are accessible through a 30 pin Pico-Clasp latching connector.

The User FPGA is configured by a SPI flash. An in-circuit debugging option is available via a JTAG header for read back and real-time debugging of the FPGA design (using Xilinx “ChipScope”). For direct JTAG access to the FPGA using the Xilinx Platform Cable USB, the TA308 Programming Kit is required.

User applications for the TMPE633 with XC6SLX25T-2 FPGA can be developed using the design software ISE WebPACK which can be downloaded free of charge from www.xilinx.com.

TEWS offers a well-documented basic FPGA Example Application design. It includes an .ucf file with all necessary pin assignments and basic timing constraints. The example design covers the main functionalities of the TMPE633. It implements local Bus interface to local Bridge device, register mapping and basic I/O. It comes as a Xilinx ISE project with source code and as a ready-to-download bit stream.

Please note: The basic example design requires the Embedded Development Kit (EDK), which is part of the Embedded or System Edition of the ISE Design Suite from Xilinx (downloadable from www.xilinx.com, a 30 day evaluation license is available).
The Embedded I/O Company

Technical Information

- Form Factor: Full-Mini Card
- Board size: 50.95 mm x 30 mm
- PCI Express 1.1 compliant interface
- Xilinx XC6SLX25T-2 Spartan-6 User programmable FPGA
- PCIe endpoint in FPGA
- 64 Mbit SPI-EEPROM for FPGA configuration and User Data
- Digital I/O
  - 26 ESD-protected 5 V-tolerant TTL lines with programmable pull resistor (-10R)
  - 13 differential RS-485 lines (-11R)
  - 13 differential M-LVDS lines (-12R)
  - Direction individually programmable
- I/O access
- 30 pin Pico-Clasp latching connector
- Operating temperature -40°C to +85°C
- MTBF (MIL-HDBK217F/FN2 @ 20°C)
  - TMPE633: 980,000 h
## Order Information

### RoHS Compliant

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMPE633-10R</td>
<td>26 TTL I/O, Spartan-6 LX25T FPGA</td>
</tr>
<tr>
<td>TMPE633-11R</td>
<td>13 RS-485 I/O, Spartan-6 LX25T FPGA</td>
</tr>
<tr>
<td>TMPE633-12R</td>
<td>13 M-LVDS I/O, Spartan-6 LX25T FPGA</td>
</tr>
</tbody>
</table>

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

### Documentation

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMPE633-DOC</td>
<td>User Manual</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
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<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDRV020-SW-25</td>
<td>Integrity Software Support</td>
</tr>
<tr>
<td>TDRV020-SW-42</td>
<td>VxWorks Software Support (Legacy and VxBus-Enabled Software Support)</td>
</tr>
<tr>
<td>TDRV020-SW-65</td>
<td>Windows Software Support</td>
</tr>
<tr>
<td>TDRV020-SW-82</td>
<td>Linux Software Support</td>
</tr>
<tr>
<td>TDRV020-SW-95</td>
<td>QNX Software Support</td>
</tr>
</tbody>
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For other operating systems please contact TEWS.

### Related Products

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<th>Part Number</th>
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<td>TA308</td>
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</tr>
<tr>
<td>TA309</td>
<td>Cable Kit for Modules with Pico-Clasp Connector</td>
</tr>
</tbody>
</table>
The Embedded I/O Company

THP815 ARCNET Controller

Application Information

The THP815 is a standard PC/104-Plus module with a 32 bit / 33 MHz PCI interface. It provides a complete ARCNET interface for up to 5 Mbps communication using the COM20020 ARCNET controller from SMSC. The THP815 is ideal suited for industrial / factory automation and automotive applications. Various network topologies are supported (Star, Tree, Bus).

According to the PC/104-Plus specification, the THP815 has the PC/104 ISA connector mounted opposite the PC/104-Plus PCI connector. No power, ground or signal is connected to it.

The following THP815 options are available:

- THP815-11R provides the traditional isolated hybrid interface available on a BNC connector, RJ11 connectors or a DB9 connector (selected by jumper). The maximum transfer rate is 2.5Mbps.
- THP815-21R provides an isolated RS485 differential driver interface available on either a DB9 connector or RJ11 connectors (selected by jumper). The maximum transfer rate is 5Mbps.

Software Support (TDRV007-SW-xx) is available for different operating systems.

Technical Information

- Standard PC/104-Plus module conforming to PC/104-Plus specification V2.0
- PCI 2.1 compliant interface
- Board size: 95.89 mm x 90.17 mm
- ARCNET Interface based on COM20020
- Complete ARCNET controller with transceiver and Dual Port RAM
- Deterministic 2.5Mbps (THP815-11R) or 5.0 Mbps (THP815-21R) Token Passing Protocol
- Improved diagnostics

- Flexible media interface
- Supports various network topologies (star, tree, bus)
- Physical interface
  - Traditional hybrid interface (isolated) for long distances. BNC, DB9 and RJ11 Connectors
  - Isolated RS485 differential driver interface with on board DC/DC converter. DB9 and RJ11 Connectors
- Operating temperature 0°C to +70°C (THP815-11R), -40°C to +85°C (THP815-21R)

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2017-08-24
Order Information

RoHS Compliant
THP815-11R  ARCNET, COM20020, 2.5 Mpbs, Hybrid Interface, BNC, 2 x RJ11, DB9
THP815-21R  ARCNET, COM20020, 5 Mpbs, isolated RS485 interface, 2 x RJ11, DB9

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
THP815-DOC  User Manual

Software
TDRV007-SW-25  Integrity Software Support
TDRV007-SW-42  VxWorks Software Support (Legacy and VxBus-enabled Software Support)
TDRV007-SW-65  Windows Software Support
TDRV007-SW-82  Linux Software Support
TDRV007-SW-95  QNX Software Support

For other operating systems please contact TEWS.
TPIM001  PIM I/O Module with 50 pin Connector

Application Information
The TPIM001 is a standard single-width PIM I/O module to be used with any PIM carrier. It offers easy access to the PMC back I/O lines of PMC carrier with back I/O.

The TPIM001 distributes the lower 50 I/O lines of the PMC to a standard 50 pin SCSI-2 type connector located in the EMI front panel.

The operating temperature range is -40°C to +85°C.

Technical Information
- Standard single-width PIM I/O Module
- Board size: 69 mm x 74 mm
- I/O lines 1 to 50 are routed to a HD50 SCSI-2 type connector in the front panel
- EMI Front Panel
- Operating Temperature: -40°C to +85°C

Order Information
RoHS Compliant
TPIM001-10R  PIM I/O Module, HD50 connector

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TPIM001-DOC  User Manual
The TPIM002 is a standard single-width PIM I/O module to be used with any PIM carrier. It offers easy access to the PMC back I/O lines of PMC carrier with back I/O.

The TPIM002 distributes all PMC back I/O lines to a 68 pin SCSI-3 type connector located in the EMI front panel. The operating temperature range is -40°C to +85°C.

### Technical Information
- Standard single-width PIM I/O Module
- Board size: 69 mm x 74 mm
- I/O lines are routed to a HD68 SCSI-3 type connector in the front panel
- EMI Front Panel
- Operating Temperature: -40°C to +85°C

### Order Information
- RoHS Compliant
- TPIM002-10R PIM I/O Module, HD68 connector

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

### Documentation
- TPIM002-DOC User Manual
TPIM003  PIM I/O Module with 68 pin Connector

**Application Information**

The TPIM003 is a standard single-width PIM I/O module to be used with any PIM Carrier like TEWS' TCP020-TM, TVME020-TM or others. It offers easy access to the PMC back I/O lines of PMC carriers with back I/O like TEWS' TCP260 or TVME8400.

The TPIM003 distributes all 64 PMC back I/O lines to a 68 pin SCSI-3 type connector located in the EMI front panel. Additional GND pins are inserted by solder jumpers at pin 9, 26, 43 and 60 of the 68 pin SCSI-3 type connector. The routing and I/O signal mapping of the TPIM003 is optimized for differential pair routing.

The TPIM003 recreates the PMC front I/O signal mapping in its 68 pin SCSI-3 type connector when used with e.g. the TPMC460, TPMC630 or TPMC868. Refer to the TPMC Data Sheets to find out if the TPIM003 recreates the PMC front I/O signal mapping in its 68 pin SCSI-3 type connector.

The operating temperature is -40°C to +85°C.

**Technical Information**

- Standard single-width PIM I/O Module
- Board size: 69 mm x 74 mm
- I/O lines are routed to a HD68 SCSI-3 type connector in the front panel
- EMI Front Panel
- Operating Temperature: -40°C to +85°C

**Order Information**

**RoHS Compliant**

TPIM003-10R  PIM I/O Module, HD68 connector, special pin assignment

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

**Documentation**

TPIM003-DOC  User Manual

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Issue  1.0.1  2017-08-31
TPIM005  PIM I/O Module with 68 pin Connector

Application Information

The TPIM005 is a standard single-width PIM I/O module to be used with any PIM Carrier like TEWS’ TCP020-TM-10R, TVME020-TM-10R or others. It offers easy access to the PMC back I/O lines of PMC carriers with back I/O like TEWS TCP260 or TVME8400. The TPIM005 distributes all 64 PMC back I/O lines to a 68 pin SCSI-3 type connector located in the EMI front panel. The routing and I/O signal mapping of the TPIM005 is optimized for differential pair routing.

The TPIM005 recreates the PMC front I/O signal mapping in its 68 pin SCSI-3 type connector when used with the TPMC862/TPMC863 or TPMC362 /TPMC363. Refer to the TPMC Data Sheet to find out if the TPIM005 recreates the PMC front I/O signal mapping in its 68 pin SCSI-3 type connector.

The operating temperature is -40°C to +85°C.

Technical Information

- Standard single-width PIM I/O Module
- Board size: 69 mm x 74 mm
- I/O lines are routed to a HD68 SCSI-3 type connector in the front panel
- EMI Front Panel
- Operating Temperature: -40°C to +85°C

Order Information

RoHS Compliant
TPIM005-10R  PIM I/O Module, HD68 connector, for TPMC863/TPMC363

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TPIM005-DOC  User Manual

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Issue 1.0.1  2017-08-31
TPIM006  PIM I/O Module for Gigabit Ethernet PMCs

Application Information
The TPIM006 is a standard single-width PIM I/O module to be used with any PIM carrier like TEWS' TCP020, TVME020 or others. It offers easy access to the PMC back I/O lines of PMC carriers like TEWS' TCP260 or TVME8400.

The TPIM006 distributes the Ethernet signals of the TEWS' Gigabit Ethernet modules with back I/O to RJ-45 connectors located in the front panel of the PIM module.

The TPIM006 reproduces the front I/O signal mapping of TEWS four channel 10/100/1000 Mbit/s Ethernet adapter PMCs in its RJ-45 connectors when used with the TPMC885-11R or TPMC385-10R for example.

The operating temperature is -40°C to +85°C.

Technical Information
- Form Factor: Standard single-width PIM I/O module conforming to VITA 36 – 199X Draft 0.1
- Board size: 69 mm x 74 mm
- I/O lines routed to RJ45 connectors in the front panel
- EMI Front Panel
- Operating temperature: -40°C to +85°C
- MTBF (MIL-HDBK217F/FN2 GB 20°C)
  TPIM006-10R: 758081 h

Order Information
RoHS Compliant
TPIM006-10R  PIM I/O Module for Quad 10/100/1000 Ethernet PMC

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation
TPIM006-DOC  User Manual

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