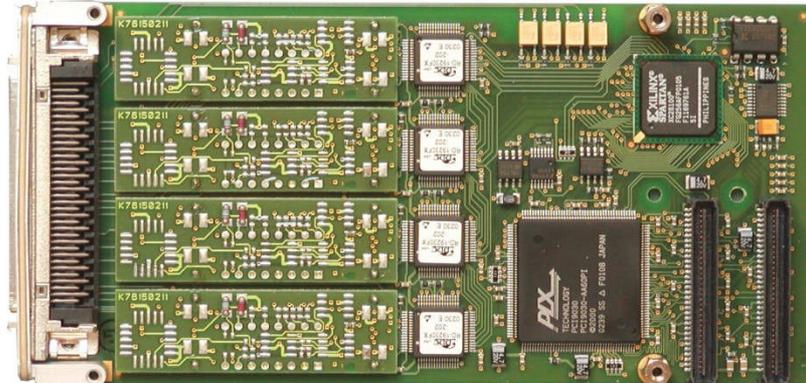


## TPMC150 4, 3, 2 or 1 Channel Synchro/Resolver-to-Digital Converter



TPMC150-10R with TPMC150-A1-xx

### Application Information

The TPMC150 is a standard single-width 32 bit PMC module providing four (TPMC150-10R), three (TPMC150-11R), two (TPMC150-12R) or one channel (TPMC150-13R) of a Tracking Synchro/Resolver-To-Digital Converter (RDC) with a converter accuracy of 2 arcmin + 1LSB.

The TPMC150 is designed for use in high performance commercial and industrial systems. It can be used for many applications like motor control, robot axis control, process control, radar antenna position information, and CNC machine tooling.

Each of the up to four RDC channels on the TPMC150 utilizes DDC's versatile state-of-the-art Tracking Synchro/Resolver-To-Digital Converter RD-19231 with programmable resolution. Resolution programming allows selection of 10, 12, 14 or 16 bit conversion. This combines the high tracking rate of a 10 bit converter with the precision of a 16 bit converter. The RD-19231 provides incremental encoder emulation. Encoder phase signals A, B and Index I are fed to an on board 32 bit up-/down encoder counter with preload and output register. Additionally the synthesized encoder signals are available for external use via RS485/422 output drivers. The RD-19231 provides a 4V velocity output with a linearity of typically 0.25%, which can be used to replace a tachometer. A 24V isolated digital input per channel can be used as general purpose input or as reference input.

A 'Simultaneous Read' function allows latching of the actual values of the selected converters at the same time.

Signal Conditioning Adapters (TPMC150-Ay-xx) are required for each channel to adapt the signal levels of the Synchro/Resolver to the RD-19231 and to configure the optional reference oscillator input/output. The Signal Conditioning Adapters will be built individually to customer specification of the Synchro or Resolver specifications, and are factory installed on the TPMC150.

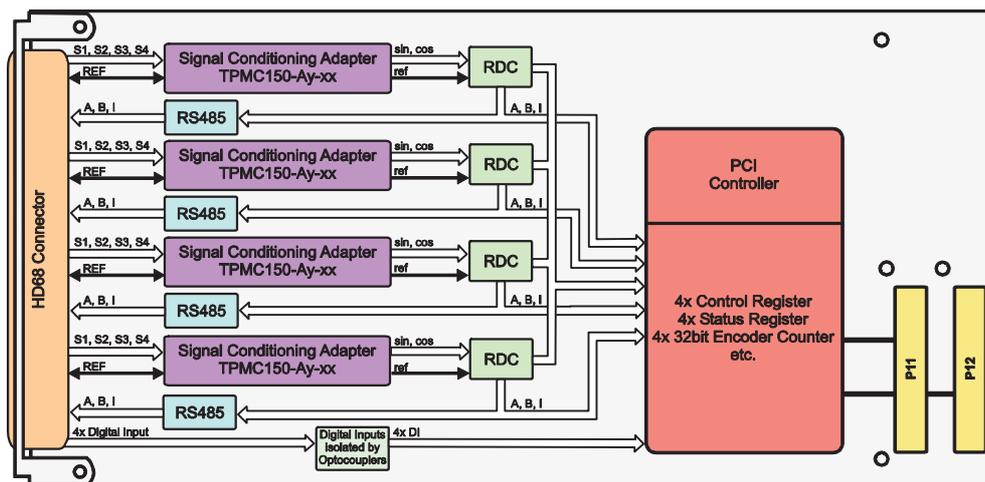
Four types of Signal Conditioning Adapters are available to adapt the signal levels of the Synchro/Resolver to the RD-19231: The TPMC150-A1-xxR and the TPMC150-A2-xxR use high precision, low TK discrete resistors. These Adapters are mainly used for resolver applications. The TPMC150-A3-xx and the TPMC150-A4-xx use a high precision resistor network with matched resistors. These Adapters are mainly used for synchro applications or resolver applications which require highest accuracy. Additionally the TPMC150-A2-xx and the TPMC150-A4-xx offer an on board reference oscillator with factory selectable frequencies in the range of 2 kHz to 10 kHz.

The on board encoder counter for each channel is a 32 bit up-/down counter with preload and output register. The encoder counter is fed with the emulated A, B and Index signals from the RD-19231. The counters are programmable for single, double and quad analysis of the incremental encoder signals. The counter can be manually or automatically loaded with the value of the preload register, depending on mode. An 'Auto Rreference Mode' provides the possibility of automatic preload of the encoder counter during normal operation, whenever the motion system passes the reference position. A 'Simultaneous Read' function allows latching of the actual values of the selected encoder counters. These values can then be read successively without interfering with normal counter function.

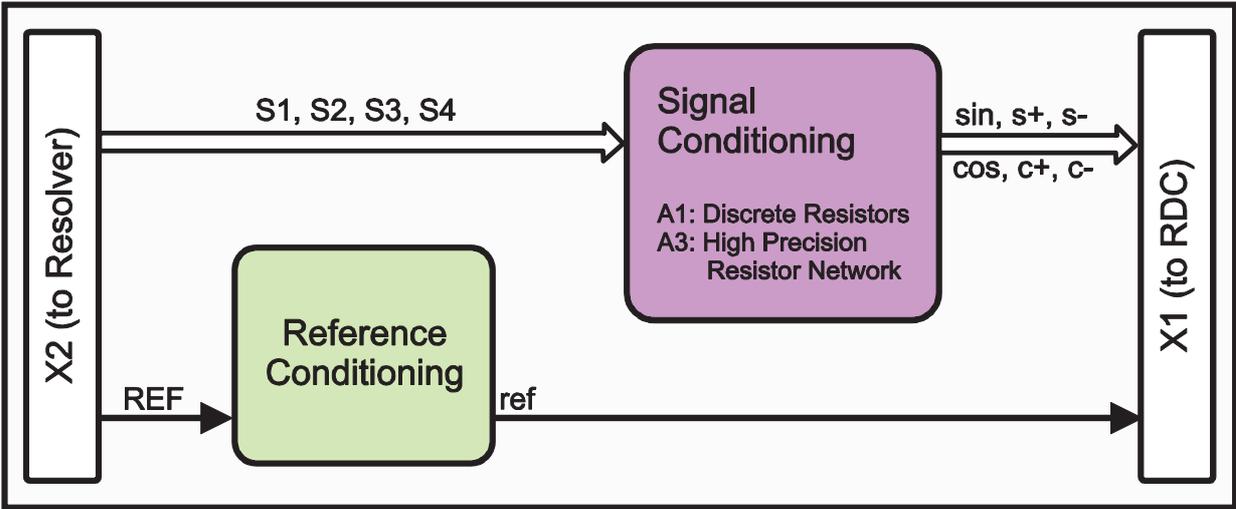
The TPMC150 offers one digital 24V input per channel which is galvanically isolated by optocouplers. A high performance input circuit ensures a defined switching point and polarization protection against confusing the pole. The inputs are electronically debounced. Each of the four digital 24V inputs can generate an interrupt, triggered on rising or falling edge. Depending on the selected mode the input can be used as general purpose input or as reference input.

## Technical Information

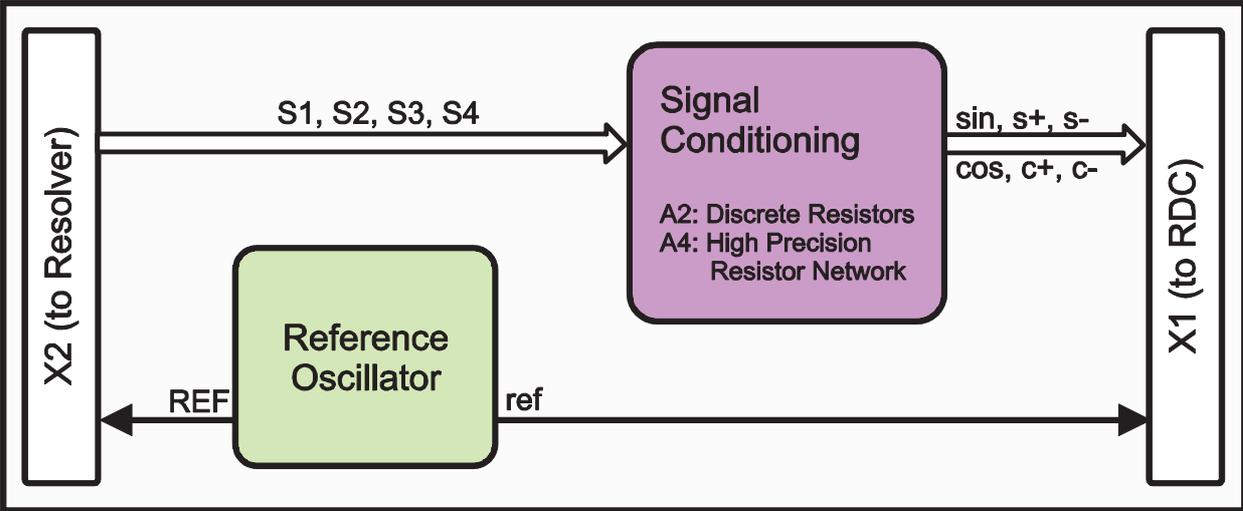
- Standard single-width 32 bit PMC module conforming to IEEE P1386.1
  - Target Chip: PCI 9030 ( PLX Technology )
  - PCI 2.2 compliant interface
  - PCI I/O Signaling Voltage 3.3V and 5V
- Four, three, two or one channel Tracking Synchro/Resolver-To-Digital-Converter
  - Based on DCC's RD-19231
  - Programmable resolution 10, 12, 14 or 16 bits
  - Converter accuracy up to 2 arcmin + 1LSB
  - Velocity and built-in-test output
  - Incremental Encoder Emulation, encoder signals available as RS422/485 outputs
  - Simultaneous Read: The values of selected converters are latched and can be read successively without interfering with normal converter function
  - Individual input voltage for each channel by signal conditioning adapter TPMC150-Ay-xx
- Signal Conditioning Adapter
  - TPMC150-A1/A2: Signal conditioning by high precision, low TK discrete resistors
  - TPMC150-A3/A4: Signal conditioning by high precision resistor network with matched resistors
  - TPMC150-A2/-A4: Reference oscillator on signal conditioning adapter
    - Oscillator frequency factory selectable 2 - 10 kHz
    - Oscillator amplitude max. 11.8Vrms / 70mA
- 32 bit up/down encoder counter with preload and output register per channel
  - Utilizes the Incremental Encoder Emulation Signals of the RD-19231
  - Single, double or quad analysis of the Incremental Encoder signals
  - Preload register, manual or automatic preload of the counter, depending on mode
  - Simultaneous Read: The values of selected counters are latched and can be read successively without interfering with normal counter function
- 1 digital 24V input per channel
  - Acts as reference input or general purpose input depending on mode
  - Generate an interrupt on rising or falling edge, depending on mode
  - Galvanic isolation by optocoupler
  - Electronically debounced
  - Protected against confusing the pole
- All I/O on HD68 SCSI-3 type female connector; No P14 I/O
- Operating temperature -40° to +85°C  
 MTBF (MIL-HDBK217F/FN2 G<sub>B</sub> 20°C)  
 TPMC150-10R: 240000 h, TPMC150-11R: 286000 h,  
 TPMC150-12R: 354000 h, TPMC150-13R: 464000 h



Block diagram TPMC150-10R



Signal Conditioning Adapter TPMC150-A1/A3



Signal Conditioning Adapter TPMC150-A2/A4 with reference oscillator

### Order Information

#### RoHS Compliant

<b>TPMC150-10R</b>	4 x Synchro / Resolver Interface, RD-19231, 2 arcmin, HD68. TPMC150-Ay-xx per ch. required
<b>TPMC150-11R</b>	3 x Synchro / Resolver Interface, RD-19231, 2 arcmin, HD68. TPMC150-Ay-xx per ch. required
<b>TPMC150-12R</b>	2 x Synchro / Resolver Interface, RD-19231, 2 arcmin, HD68. TPMC150-Ay-xx per ch. required
<b>TPMC150-13R</b>	1 x Synchro / Resolver Interface, RD-19231, 2 arcmin, HD68. TPMC150-Ay-xx per ch. required
<b>TPMC150-A1-xxR</b>	Resolver Signal Cond. Adapter (factory installed)
<b>TPMC150-A2-xxR</b>	Resolver Signal Cond Adapter with Reference Oscillator (factory installed)

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

#### Non- RoHS Compliant

<b>TPMC150-A3-xx</b>	High Precision Synchro / Resolver Signal Cond. Adapter (factory installed)
<b>TPMC150-A4-xx</b>	High Precision Synchro / Resolver Signal Cond. Adapter with Reference Oscillator (factory installed)

#### Documentation

<b>TPMC150-DOC</b>	User Manual
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#### Software

<b>TPMC150-SW-25</b>	Integrity Software Support
<b>TPMC150-SW-42</b>	VxWorks Software Support (Legacy and VxBus-Enabled Software Support)
<b>TPMC150-SW-65</b>	Windows Software Support
<b>TPMC150-SW-82</b>	Linux Software Support
<b>TPMC150-SW-95</b>	QNX Software Support

For other operating systems please contact TEWS.

#### Related Products

<b>TA304</b>	Cable Kit for Modules with HD68 Connector (Please note: Cables, Terminal Blocks and Cable Kits are rated up to 30V only!)
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