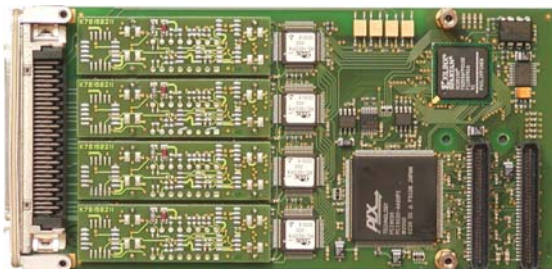# TPMC150   4, 3, 2 or 1 Channel Synchro/Resolver-to-Digital Converter

Application Information

The TPMC150 is a standard single-width 32 bit PMC module providing four (TPMC150-10), three (TPMC150-11), two (TPMC150-12) or one channel (TPMC150-13) 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, industrial and military systems. It can by used for many applications like motor control, robot axes control, process control, radar antenna position information, and CNC machine tooling.


TPMC150-10R with TPCM150-A1-x

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 RDC19230 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 RDC19230 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 RDC19230 provides a 4V velocity output with a linearity of 0.75%, 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.
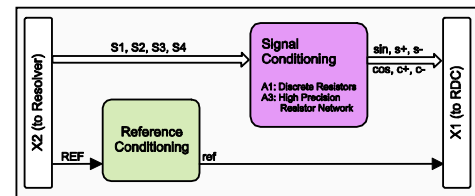
Signal Conditioning Adapters (TPMC150-Ay-xx) are required for each Synchro/Resolver channel to adapt the signal levels of the Synchro/Resolver to the RDC19230 and to configure the optional reference oscillator input/output. The Signal Conditioning Adapters will be built individually to customer specification of the Synchro or Resolver specifications.
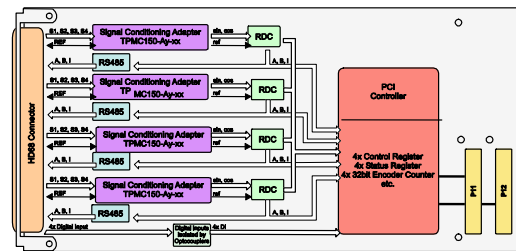

Block diagram TPMC150-10x

The Signal Conditioning Adapters 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 RDC19230: The TPMC150-A1-xx and the TPMC150-A2-xx 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.

Signal Conditioning Adapter TPMC150-A1/A3

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 RDC19230. 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-reference 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.
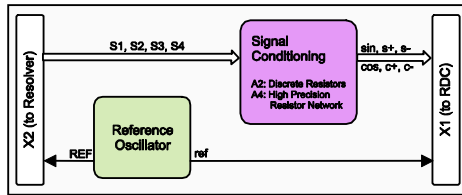
Signal Conditioning Adapter TPMC150-A2/A4 with reference oscillator

The TPMC150 offers per channel one digital 24V Input 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 RDC19230
  - 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 RDC19230
  - 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

Order Information

RoHS Compliant

TPMC150-10R   Four channel tracking RDC, converter accuracy 2 arcmin +1LSB

TPMC150-11R   Three channel tracking RDC, converter accuracy 2 arcmin +1LSB

TPMC150-12R   Two channel tracking RDC, converter accuracy 2 arcmin +1LSB

TPMC150-13R   One channel tracking RDC, converter accuracy 2 arcmin +1LSB

TPMC150-A1-xxR   Resolver Signal Conditioning Adapter

TPMC150-A2-xxR   Resolver Signal Conditioning Adapter with reference oscillator

None RoHS Compliant

TPMC150-10   None RoHS compliant version of TPMC150-10R

TPMC150-11   None RoHS compliant version of TPMC150-11R

TPMC150-12   None RoHS compliant version of TPMC150-12R

TPMC150-13   None RoHS compliant version of TPMC150-13R

TPMC150-A1-xx   None RoHS compliant version of TPMC150-A1-xxR

TPMC150-A2-xx   None RoHS compliant version of TPMC150-A2-xxR

TPMC150-A3-xx   High Precision Synchro/Resolver Signal Conditioning Adapter (None RoHS compliant)

TPMC150-A4-xx   High Precision Synchro/Resolver Signal Conditioning Adapter with reference oscillator (None RoHS compliant)

Documentation

TPMC150-DOC   User Manual

TPMC150-ED   Engineering Documentation, includes TPMC150-DOC

Software

TPMC150-SW-25   Integrity Software Support

TPMC150-SW-42   VxWorks Software Support (Legacy and VxBus-Enabled Software Support)

TPMC150-SW-65   Windows XP/XPE/2000 Software Support

TPMC150-SW-72   LynxOS Software Support

TPMC150-SW-82   LiNUX Software Support

TPMC150-SW-95   QNX 6 Software Support

For other operating systems please contact TEWS.

Related Products

TA304   Cable Kit for modules with HD68 connector