

## TIP111 Motion Controller using absolute Encoder (SSI)

### Application Information

The TIP111 family are IndustryPack® compatible modules for motion control applications using absolute encoder with a serial interface (SSI) as position feedback.

There are two versions available: The TIP111-1x is the implementation of a one axis controller and the TIP111-2x offers a two axes controller on a single size IP. The transition module TIP111-TM-xx is required for the signal conditioning and optional galvanically isolation of the various input and output signals.



The position feedback is provided by an absolute encoder with a synchronous serial interface (SSI) and a corresponding 32 bit shift register at the IP. The level of the encoder signals can be TTL or RS422. Optionally the encoder signals can be isolated on the transition module by high speed optocoupler. The TIP111 can handle data stream which are encoded in Binary or in Gray Code.

Two isolated 24V DC digital inputs have limit switch functionality. Each of these inputs drives a floating optocoupler output as hardware feedback. These outputs can be used to disable the power on the motor power amplifier, dependent on the actual direction. Two additional isolated 24V digital inputs are for free use by the software, for example as emergency stop input. A floating optical output can be controlled by software, for example as enable signal for the motor power amplifier.

A 16 bit digital to analog converter (DAC) produces a +/- 10V controller output signal which can be used as speed or torque source for the power amplifier of the motor drive system. A galvanically isolation of this signal with the help of an isolation amplifier will be supplied as a transition module option. A 12 bit analog to digital converter (ADC) with a configurable input voltage range is also available.



For First-Time-Buyers the engineering documentation TIP111-ED is recommended. The engineering documentation includes TIP111-DOC, schematics and data sheets of TIP111 and TIP111-TM.

Driver support (TIP111-SW-xx) is available for different operating systems.

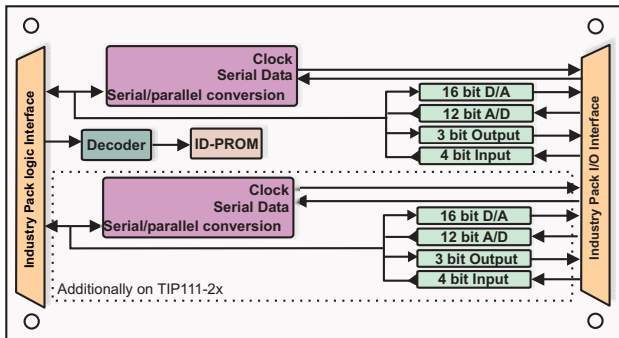
### Technical Information

#### TIP111

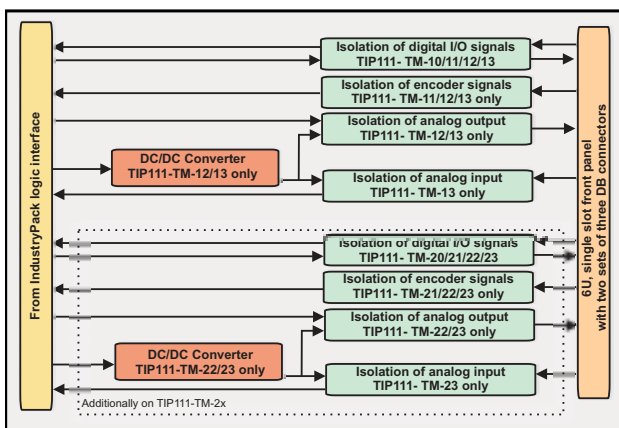
- Interface according to IndustryPack specification
- Identification-PROM supports auto-configuration
- Single Size IndustryPack
- Synchronous serial interface (SSI), programmable word length up to 32 bit
- 16-bit D/A converter per axis with +/- 10 V output signal to control servo amplifier
- 12-bit A/D converter per axis with adjustable input voltage range e.g. for connection of a joystick
- 4 inputs per axis for limit switches, emergency stop
- 3 outputs per axis for control of axis enable and current limiting

#### TIP111-TM

- 50 pin flat cable connection to TIP111
- Signal distribution by three DB connectors per axis in a 6U/1Slot front panel
- Encoder interface directly to RS422 or TTL level
- Signal conditioning for all signals possible:
  - Isolation of all digital 24V I/O signals
  - Isolation of encoder signals
  - Isolation of analog output
  - Isolation of analog input



Block diagram TIP111



Block diagram TIP111-TM-xx

## Order Information

- TIP111-10** One Axis Absolute (SSI) Motion Controller
- TIP111-11** As TIP111-10 but includes run-time-licence for TIP111-SW-x2
- TIP111-20** Two Axes Absolute (SSI) Motion Controller
- TIP111-21** As TIP111-20 but includes run-time-licence for TIP111-SW-x2
- TIP111-TM-10** Transition module for TIP111-1x, provides isolation of all 24V digital I/O signals
- TIP111-TM-11** As TIP111-TM-10 but add. isolation of encoder
- TIP111-TM-12** As TIP111-TM-10 but add. isolation of encoder and analog output
- TIP111-TM-13** As TIP111-TM-10 but add. isolation of encoder and analog input and output
- TIP111-TM-20** Transition module for TIP111-2x, provides isolation of all 24V digital I/O signals
- TIP111-TM-21** As TIP111-TM-20 but add. isolation of encoder
- TIP111-TM-22** As TIP111-TM-20 but add. isolation of encoder and analog output
- TIP111-TM-23** As TIP111-TM-20 but add. isolation of encoder and analog input and output
- TIP111-DOC** User Documentation (TIP111 and TIP111-TM)
- TIP111-ED** Engineering Documentation, includes TIP111-DOC
- TIP111-SW-12** OS-9 Software Support
- TIP111-SW-32** pSOS Software Support
- TIP111-SW-42** VxWorks Software Support
- TIP111-SW-62** Windows NT 4.0 Software Support
- TIP111-SW-72** LynxOS Software Support
- TIP111-SW-82** LiNux Software Support
- TIP111-SW-92** QNX 4 Software Support
- TIP111-SW-95** QNX 6 Software Support