

Features

- **2/3-port EtherCAT Slave Controller (ESC) with 2 Integrated Fast Ethernet PHYs**
- **Standard EtherCAT Slave Controller (ESC)**
 - 8 Fieldbus Memory Management Units (FMMUs)
 - 8 Sync Managers
 - 64-bit distributed clock
 - 9K bytes RAM
- **Integrated Fast Ethernet PHYs**
 - Compliant with IEEE 802.3/802.3u 100BASE-TX/100BASE-FX
 - PHY loopback mode
 - Supports twisted pair crossover detection and auto-correction (HP Auto-MDIX)
 - Automatic polarity detection and correction
- **3rd Ethernet MII Port for Flexible EtherCAT Network Configurations**
- **Up to 32 Digital/General Purpose IOs**
 - Each IO is configurable individually and mapped to FMMU directly
- **SPI Slave Interface**
 - Supports Mode 3 timing modes
 - Supports MSB first transfer fashion
- **Local Bus Interface**
 - Supports 8-bit or 16-bit data bus width
 - Supports Asynchronous Local Bus
 - Supports BHE with 16-bit data bus width
- **Bridge**
 - Supports Function and ESC registers mirror with selectable synchronous conditions
- **3-channel PWM Controller**
 - Adjustable frequency, phase align and BBM (Break Before Make) for all channels
 - Adjustable duty cycle, phase shift, and signal polarity per channel

Product Brief

- **Step & Direction Controller**
 - Adjustable step pulse width, polarity and the delay time for direction change
- **Incremental and Hall Encoder Interface**
 - Support single ended ABZ with configurable counting constant, polarity and Multiple Z-signal functions support
 - Supports clockwise/counter clockwise (CW/CCW) and direction-count (DIR/CLK) Inputs
 - Supports Hall sensor
- **Emergency Stop Input**
- **Configurable Watchdog for Outputs and Inputs Monitoring**
- **IRQ Event Output**
 - Interrupts for EtherCAT related events
 - Interrupts for Application related events
 - Interrupts for Watchdog Timeout
- **SPI Master Interface**
 - Programmable SPI clock frequency up to 50MHz
 - Supports 4 timing modes
 - Supports MSB/LSB first transfer fashion
 - Supports up to 8 SPI devices selection
 - Supports up to 8 channels, each channel with 8 bytes read/write buffer
 - Supports ADC Data Ready and DAC Data Loaded indication
 - Supports periodic data acquisition
 - Supports late sample for high latency device
 - Supports external interrupt input
- **Supports I²C Master Interface**
- **Integrates On-chip Power-on Reset Circuit**
- **80-pin LQFP RoHS Compliant Package**
- **Operating Temperature Range: -40 to +105°C**

※ EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

Product Description

The AX58100 is a 2/3-port EtherCAT Slave Controller (ESC), licensed from Beckhoff Automation, with two integrated Fast Ethernet PHYs which support 100Mbps full-duplex operation and HP Auto-MDIX. The AX58100 supports the CANopen over EtherCAT (CoE), File Access over EtherCAT (FoE), Vendor Specific-protocol over EtherCAT (VoE), etc. standard EtherCAT protocols and provides a cost-effective solution for industrial automation, motion/motor/digital I/O control, Digital to Analog (DAC)/Analog to Digital (ADC) converters control, sensors data acquisition, robotics, etc. industrial fieldbus applications.

The AX58100 provides either a three-channel PWM controller or a Step/Direction controller, and an Increment/Hall encoder interface for closed-loop motor control; a SPI master controller for DAC/ADC converter control and sensors data acquisition; 32 DIOs for industrial I/O control and an I/O watchdog for functional safety.

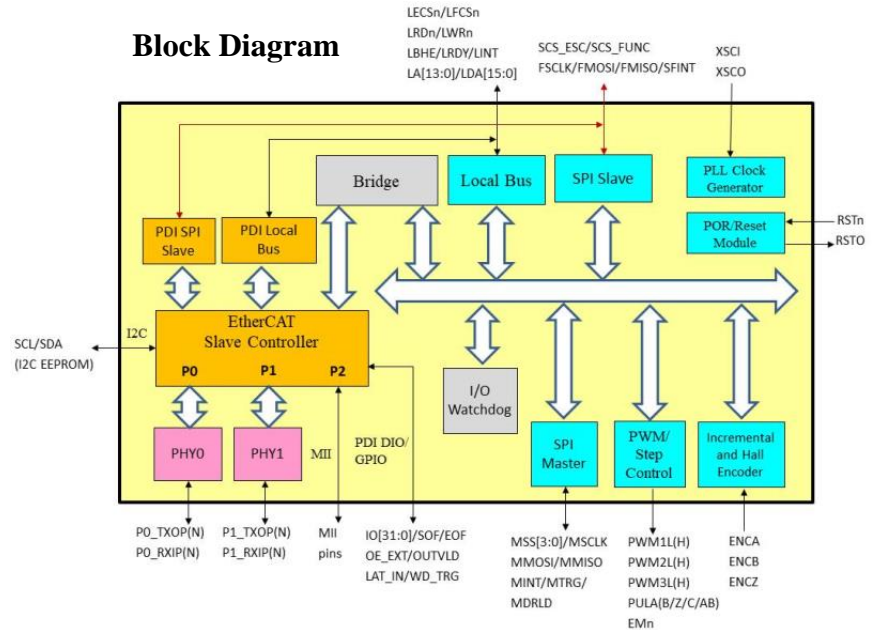
The AX58100 provides two Process Data Interfaces (PDI), SPI slave and Local bus, support the connection with most popular MCU and DSP on those traditional non-EtherCAT fieldbus applications. The AX58100 provides two memory spaces, ESC and Function, designers can use chip select to decide to access which one. The bridge will synchronize two memory spaces' contents for EtherCAT Master to remotely control AX58100 functions (PWM, SPI master etc.). The AX58100 reports the ESC and Functions interrupt events to interrupt status registers and supports level or edge interrupt trigger mode to inform external MCU/DSP to manage these ESC and Functions interrupt events. AX58100 supports a configurable individual function SPI slave interface to enhance SPI slave bandwidth.

The AX58100, in 80-pin LQFP with EPAD, supports the RoHS compliant package and industrial grade operating temperature range from -40 to 105°C.

Target Applications

- Industrial Automation
- Motor Control
- Motion Control
- Robotics
- Digital I/O Control
- DAC/ADC Converters Control
- Sensors Data Acquisition
- Communication Module
- Operator HMI Interfaces

Block Diagram



Applications Diagram

