

1. Introduction

1.1 General

It's already possible to count through standard digital input, but the maximum frequency is depending of the program structure or PLC cycle time. The on-board counter of the PCD2 can count up to approx. 10 kHz.

The H110 counting module not only extends the frequency range to 100 kHz, but also allows accurate measurement of frequencies up to 100 kHz and the length of periods or pulses up to one hour.

Its two counting inputs, A and B, enable it to recognize the rotational direction of incremental shaft encoders, thus making the ..H110 module also capable of axis control, as long as regulated motion is not required from the module. For the regulated control of servo-motors with starting and braking ramps, we recommend the PCD2.H3.. motion control module.

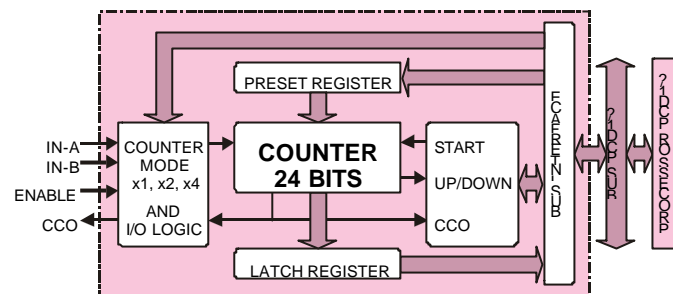
The H110 counting and measuring module uses a modern FPGA component (Field Programmable Gate Array), which can also be programmed for other specific OEM tasks by means of plug-in PROM. For this purpose, 4 inputs, 4 outputs and 2 x 4 LEDs can be provided to the outside.

1.2 Function and application

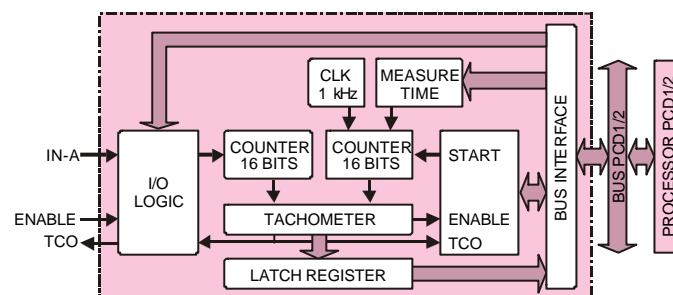
This low-cost module can be plugged in almost any I/O socket on a PCD1 or PCD2. Only the slot 8 of the PCD2 doesn't support the H110 module.

The module can be used in different modes:

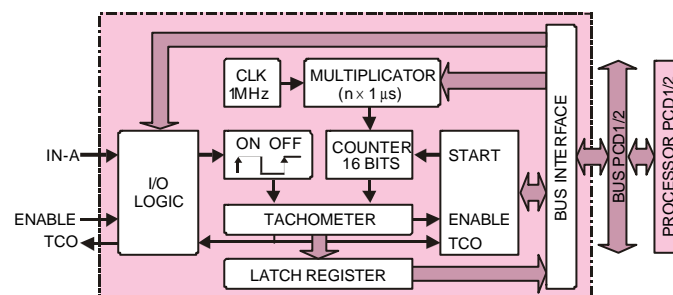
Block diagram as counting module



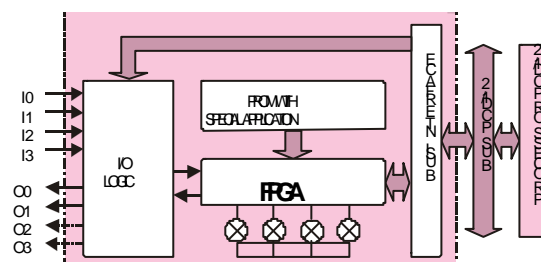
Block diagram for frequency measurement



Block diagram for measuring period or pulse length



Block diagram for special OEM versions



1.3 Main characteristics

- Up to 12 PCD2.H110 modules in parallel operation can be inserted in one PCD2, or up to 4 in one PCD1.
- Counting and measuring functions can be utilized simultaneously in the same module.

As a counting module

- Counting frequency up to 100 kHz
- Counting range 0 ... 16 777 215 (24 bit)
- Preset value 0... 16 777 215 (24 bit)
- Up or down counting to preset value
- 2 digital inputs A and B with recognition of rotational direction
- 1 direct counter output CCO
- Selectable counting modes

For frequency measurement

- Frequency range 500 Hz to 100 kHz
- Measurement range 0 ... 65 535 (16 bit)
- Accuracy $\geq 1\%$. (depending on measurement time)
- The fast TCO output can be used at the end of a measurement, e. g. to trigger an interrupt

To measure period or pulse length

- Frequency range 0.27 mHz to 500 Hz
- Period or pulse lengths from 2 ms to 1h
- The fast TCO output can be used at the end of a measurement, e. g. to trigger an interrupt.

1.4 Typical areas of application

The use of the H... modules on the PCD1 or PCD2 extends considerably extends the area of application. In particular, the ..H110 enables:

- fast pulse counting proportional to quantities (items, units of energy, etc.), placing little load on the basic CPU
- unregulated axis control of any drives with incremental shaft encoders
- quartz accuracy in determining velocity, rotary frequency, flow rate, etc.

1.5 Programming

Access to the whole functionality of the module is done through direct periphery access.