INPUTS AND FAST COUNTERS BOARD (MTC-3052)

Description

Inputs and fast counters board designed for complex controls in real time. It can be configurated through a simple software. Has variety of intern counters and extern inputs, encoder and interruption sources.

Its frontal side is made up of:

- Flat cable for connexion with interface I/O (MTC-3053).
- Led diodes that show the I/O states of the equipment (the ones on the top for inputs and the lower ones for the outputs).

Application

Complex systems that require precision and/or results optimisation in real time, for example:

- Displacement registers.
- Incrementing and/or decrementing counting.
- Signals tracking.
- Motors control, speed as well as position.
- Systems synchronization.
- Measurements control.
- Signals delay.
- Time measurements.

Technical Specifications

- ✓ Europe board format.
- ✓ Max. input operative frequency 150KHz.
- ✓ Opto-isolated inputs, configurable as clocks or high speed digital signals.
- ✓ Easy use from PLC (SW Codesys)
- ✓ High speed intern oscillator for precision measurements (80MHz).
- ✓ Interruptions generator to CPU MTC-3000.
- ✓ 26_{PIN} flat cable (for interface connexion).
- ✓ 7 counters with different configurations (definable by user).
  - 4 of general purpose (bi-directional).
  - 1 for measurements (just decremental).
  - 2 specific use (bi-directional).
- ✓ 11 possible interruption sources with programmable slope (8 come from the interface and 3 from the bus).
- ✓ 4 outputs, (1 of them can be configurated (by hardware) as delayed signal of a fast input).
- ✓ Possibility of several cards connexion in the same RACK if the application requires it.

Blocks description

The control of counters, inputs, outputs and interruption sources is done through programmable blocks inside the programming environment of SW Codesys. Some of this blocks require a base address. This address depends on the physical position of the card inside the RACK.

1-Inputs, outputs and interruptions block

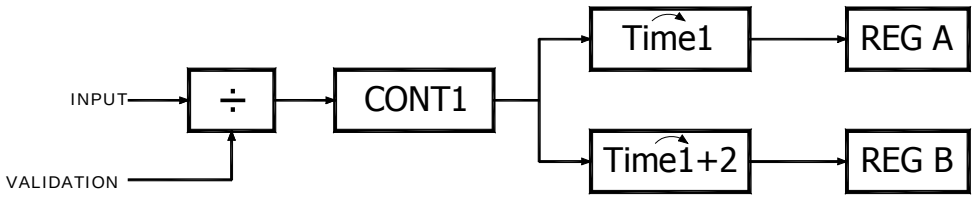
Inputs: This board has 11 possible inputs, 8 come from the interface through flat cable and 3 can come from any MTC-3001 frequency converter connected in the RACK. The inputs state can be visualized through led diodes on the top part of the card frontal.

Outputs: This board has 4 possible outputs. This outputs can be configurated as normal outputs or delayed outputs of any of the inputs. The physical access to these outputs is done through the interface, through flat cable. The outputs state can be visualized through led diodes on the lower part of the card frontal side.

Interruptions: Each input can produce interruptions, the interruptions slope can be programmed (ascendant or descendent slope).

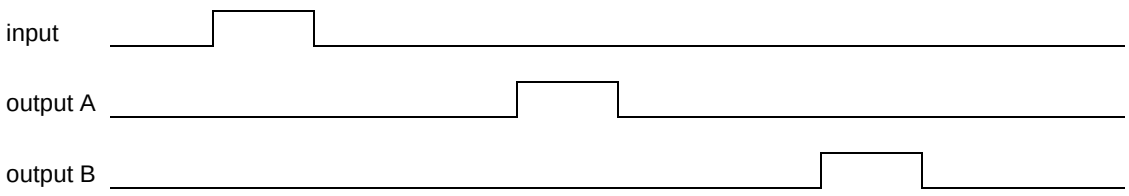
2-Retardant block

This block generates from a specific input two outputs, A and B, delayed "N" clock pulses, these pulses are previously programmed in two registers. The A and B delayed outputs signal width is fixed, "3 ms".



The possible inputs to delay are the 8 inputs of the interface or the 3 intern inputs of the RACK. These come from any device or exterior peripheral.

The times base of the counters come from any of the 8 inputs of the interface or of the 3 interns of the RACK.

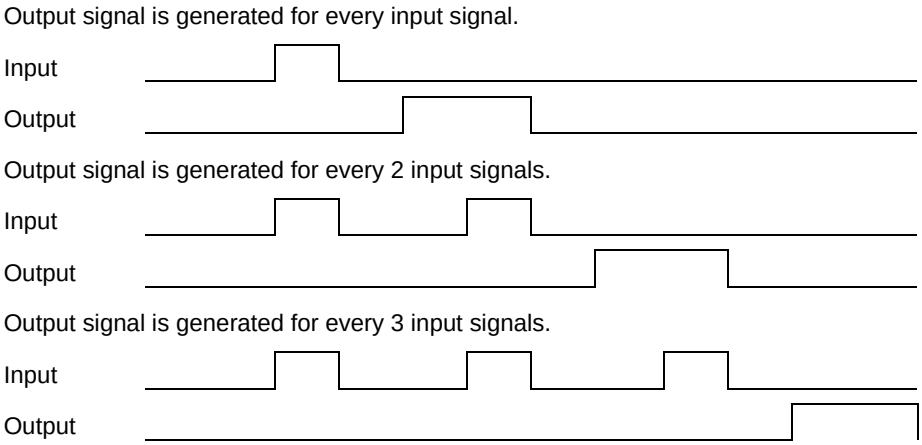


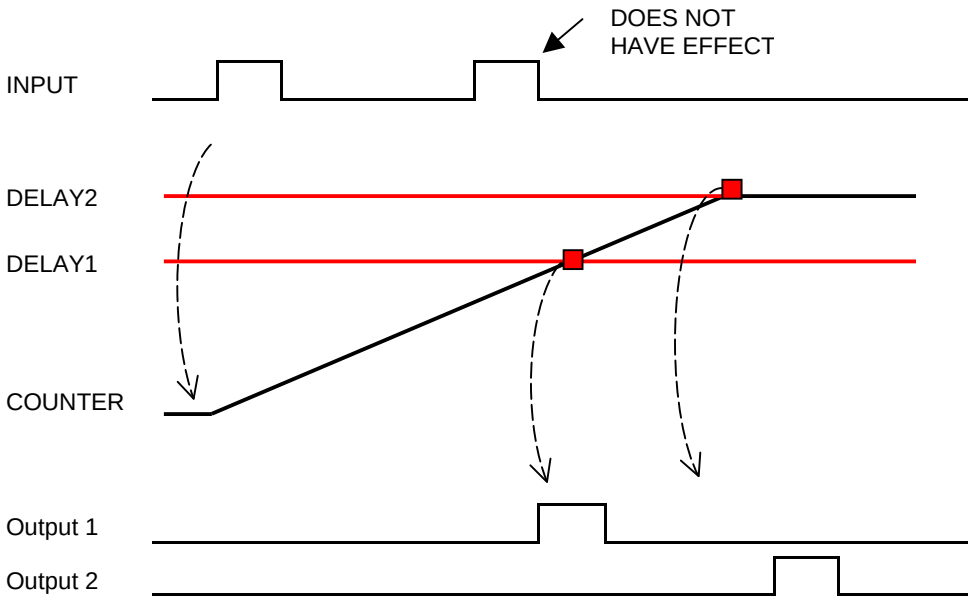
In this example, since the input is produced until output "A" takes place "N" clock impulses have passed and "N+X" until "B" output is generated.

The aim of this counter is to delay the reaction of any device in real time.

Apart from delaying the outputs, they can be divided in several factors: 1,2 or 3. This means that the delayed output will be generated every "X" inputs.

Has nothing to do the input signal width with the width of the generated one.





3- 1MHz Counter block

This is a block with a general purpose counter of 32 bits. Each bits corresponds to 1 µs (microsecond). This counter is always counting.

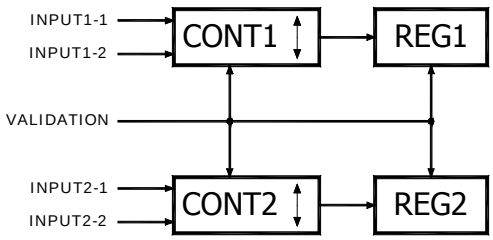
The user would do two reading accesses to the 1MHz counter, and out of this block would calculate the time difference between two readings.

4-Block of 2 counters with different input bases and simultaneous charge

This block has 2 auto-addressed counters (they increase or diminish the value, according to direction). To detect the turning way each counter has 2 inputs. The input of each counter is independent, each of them has its own time base. Through a validation signal are obtained, in 2 output registers, the values of the counters simultaneously, and these, at the same time, are multiplied by 4.

For counter1 is used a base of 16 bits and for counter2 a base of 32 bits. This block has two inputs and two registers associated to the same one.

Input 1 = 16 bits counter
Input 2 = 32 bits counter
} has two inputs and two outputs recorc



The validation signal can be done by a external signal or through a comparison of one of the counters.

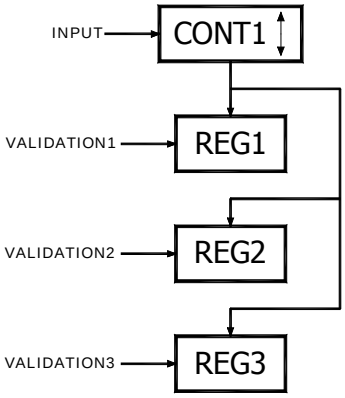
5-Counters with 3 associated registers block

It's a counter of 32 bits with 3 registers associated with external load. It is a bi-directional counter (ascendant or descendent).

The particularity of the counter is that in every register "latched" the counter value after a programmed extern control signal, being able to read at any time (As long as the register has not been previously rewritten).

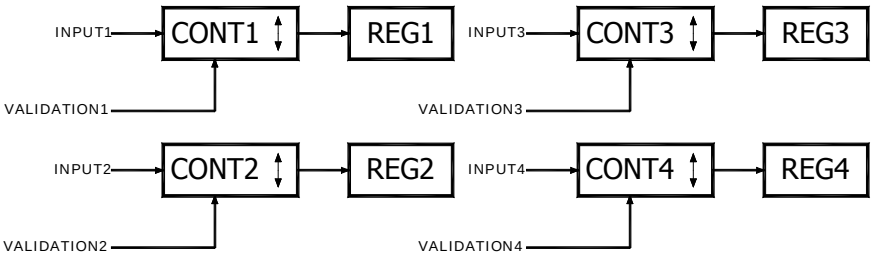
The control signals come from the 8 interface inputs or from the 3 RACK intern inputs. This inputs can be any device or external peripheral.

The counter clock pulses can also come from the 8 interface inputs or from the 3 interns in the RACK, this clock inputs are usually signals from the encoder.



6-4 selectionable counters block

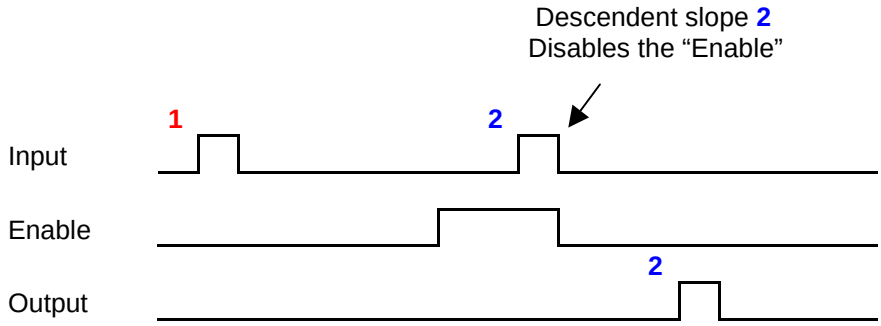
This block has 4 selectionable counters of 16 bits. The value of the counter is loaded with the order of any of the 11 inputs (8 interface or 3 RACK). The counter clock base can be programmed through an input of the block. He counter is addressable (ascendant or descendent).



7-Delayed counter with auto-reset validation block

This block delays an X input a certain number of impulses. The enable input bit is auto deleted when a sign arrives, because of that it's necessary to authorize it again to receive a new input.

In the following example, input "**2**" is delayed at the output a certain number of impulses. Input "**1**" is not delayed because it does not coincide with the active enable. The descendent slope of input "2" disables the Enable signal.



The control signals come from any of the 8 interface inputs or of the 3 intern inputs of the RACK. This inputs can be of any device or external peripheral.

The counter clock pulses come from the 8 interface inputs or from the 3 internals on the RACK, this clock inputs are usually encoder signals.