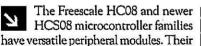
Routines directly measure microcontroller-bus clock

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clock generators are no exceptions.

They range from the internal clock, which frees I/O pins, to external crys-

tals or oscillators. Once you select the timing source, you have many options for controlling the final bus frequency. For instance, connecting a 32,768-Hz crystal to an MC9S08GB microcontroller allows you to use the FLL (frequency-locked loop) to generate many bus frequencies as high as 18.874 MHz.

designideas

Selecting the source, the divisors, and the FLL settings allows versatility but also can get complicated.

Once you write the bus-clock-initialization routine, you may want to verify that the bus is running at the speed you intend before moving on to the rest of the project. This Design Idea presents routines that output a square wave at exactly one-tenth the bus speed on any I/O port (listings 1 and 2). Just connect a frequency counter to this pin, and it will display your bus frequency. All you have to do is move the decimal point one place to the right. Once you verify the bus speed, you can confidently write the timer, serial-I/O, and other clock-dependent routines.

You need to write code only to first disable interrupts and disable the COP (common on-chip processor). In your bus-clock-initialization routine, be sure to initialize the I/O port you want to use as an output. Then, just jump to the toggle clock, which outputs the bus frequency divided by 10 until powerdown. This Design Idea uses PB0 in the HC08 version and PD0 in the to choose a bit. Also, this Design Idea to identify the port and the second line | able PTB.EDN

HCS08 version. You can use any avail- i names ports with the older notation able I/O port by altering the first line : PB, instead of today's more fashion-

LISTING 1. CODE FOR HC08

:TOGCLK - toggle PB0 at 1/10th the bus clock freq. (square wave) (NEVER ENDS)

TOGCLK LDHX #PB :put 16-bit address of PB in H:X LDA #S01 ;make whatever bits in PB that will toggle=1 TOG01 CLR.X NOP NOP NOP STA.X **BRA TOG01**

LISTING 2 CODE FOR HCS08

:TOGCLK - toggle PD0 at 1/10th the bus clock freq. (square wave) (NEVER ENDS)

TOGCLK LDHX #PD ;put 16-bit address of port PD in H:X LDA #S01 ;make whatever bits in PD that will toggle=1 TOG01 STA X NOP CLR .X **BRA TOG01**