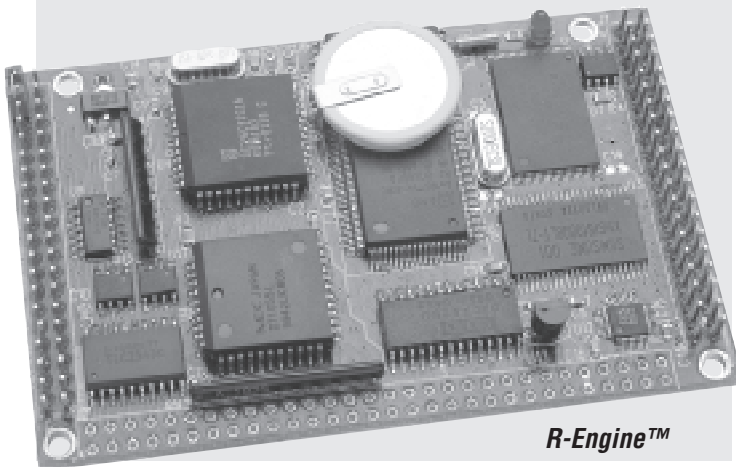


# R-Engine™ (RE)

80 MHz 16-bit CPU, 3 UARTs, 16-bit ADCs, DAC, 40+ I/Os



## Features:

- 3.6 x 2.3 x 0.3", Easy program in C/C++
- -40°C to +80°C, 160/20 mA normal/power-save
- 80 MHz R1100 or 40 MHz Am186ER(32KB RAM)
- 256 KW 16-bit Flash, 256 KW 16-bit SRAM, 512 bytes EE
- 40+ TTL I/Os, Real-time clock, 3 UARTs, PWM, counters
- 8 parallel ADC (AD7852), and 8 16-bit ADC (ADC8344)
- 4 parallel DAC (DAC7625) and 2 serial DAC(DAC7612)

The **R-Engine™ (RE)** is a high performance C/C++ programmable controller with a 16-bit external bus. Two versions of R-Engine are available: the **RE80** is based on the 80 MHz R1100, and **RE40** is based on the similar 40 MHz Am186ER. The **RE** is intended for OEM applications requiring industrial process control and high-speed data acquisition.

The **RE** features fast execution times through 16-bit ACTF Flash (256 KW) and battery-backed SRAM (256 KW); it also includes 3 timers, PWMs, 32 PIOs, 24 PPIs, 512-byte serial EEPROM, an internal UART, a sync serial port, 3 timer/counters, and a watchdog timer. The three 16-bit timers can be used to count or time external events, up to 10 MHz, or to generate non-repetitive or variable-duty-cycle waveforms as PWM outputs. The 32 PIO pins from the CPU are multifunctional and user programmable.

The **RE40** has 32KB internal RAM, which fulfills many embedded OEM product SRAM requirement. No external SRAM would be required for an OEM version of the RE40. This increases system reliability and decreases power consumption and cost.

A serial real-time clock (DS1337, Dallas) is a low power clock/calendar with two time-of-day alarms and a programmable square-wave output. A Dual UART (SCC2692 or SC26C92) provides two channels of full-duplex asynchronous receivers and transmitters; this combines with a single serial port available from the processor for a total of three UARTs. (This differs from most other core Engine controllers which offer 2 ports through the processor.) The SC26C92 DUART receivers are quadruple buffered to minimize the potential of receiver overrun or to reduce interrupt overhead. The UARTs incorporate 9-bit mode for multi-processor communications. Each DUART also offer 7 TTL inputs and 8 TTL outputs. The PPI (82C55) provides an additional 24 user programmable bi-directional I/Os.

The 16-bit ADC (ADS8344, TI) provides 8 single-ended or 4 differential analog inputs (0-5V, or 0-REF) with 65536 counts of resolution at up to 10 KHz sample rate. The DAC (DAC7612) supports two channels of 12-bit, 0-4.095V analog voltage outputs capable of sinking or sourcing 5 mA. A high speed parallel ADC (AD7852, 300KHz, 8 ch., 12-bit, 0-5V), and a parallel DAC (DA7625, 5 μs, 4 ch, 12-bit, 0-2.5V) can be installed.

All chips are surface mounted for highest reliability. RE works with TERN's expansion boards: MC, MCP, P50, P100 and FC0.

## Ordering Information

**RE80/RE40**                      **\$99/\$79/\$49**                      **Qty 1/100/1K+**

Includes: 80/40MHz RE, I/Os, 3 UARTs, 3 timers, 82C55, watchdog timer, EE, 256KW Flash

NOT including add-on options. OEM option discounts available.

## Add-on Options:

- 1) SRAM a) 64KW b)256KW ..... \$20/\$40
- 2) Real-time clock (RTC) and battery ..... \$20
- 4) 4 ch. 12-bit DAC, 200 KHz (DA7625) ..... \$60
- 5) 2 ch. 12-bit DAC (DAC7612) ..... \$40
- 6) 8 ch. 12-bit ADC, 300 KHz (AD7852) ..... \$40
- 7) 8 ch. 16-bit ADC (ADC8344) ..... \$40
- 8) Sockets for expansion: two 20x2, one 30x2 ..... \$9

## Typical Order Example:

80 MHz R-Engine™, 256KW SRAM

RE80 + 1(b) = \$99 + \$40 = \$139

Signals routed to J1 and J2, as shown below:

J1 signal			J2 signal		
Function	Pin #	Pin # Function	Function	Pin #	Pin # Function
VCC	1	2.....GND	GND	40	39.....VCC
OP1	3	4.....CLK	P4	38	37.....P14
RxDB	5	6.....GND	IP0	36	35.....P6
TxDB	7	8.....D0	TxD0	34	33...../INT4
VOFF	9	10.....D1	RxD0	32	31.....P19
/BHE	11	12.....D2	P5	30	29.....P1
D15	13	14.....D3	TxDA	28	27.....OP0
/RST	15	16.....D4	RxDA	26	25.....OP2
RST	17	18.....D5	P2	24	23.....P15
P16	19	20.....D6	IP2	22	21.....INT3
D14	21	22.....D7	P0	20	19...../INT2
D13	23	24.....GND	P25	18	17.....P24
	25	26.....P12	IP3	16	15.....IP4
D12	27	28.....A7	P11	14	13.....OP7
/WR	29	30.....A6	P10	12	11.....P13
/RD	31	32.....A5	A19	10	9.....P23
D11	33	34.....A4	/INT0	8	7.....NMI
D10	35	36.....A3	/INT1	6	5.....SCLK
D9	37	38.....A2	P26	4	3.....SDAT
D8	39	40.....A1	GND	2	1.....GND



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