Triangle Digital Services Ltd
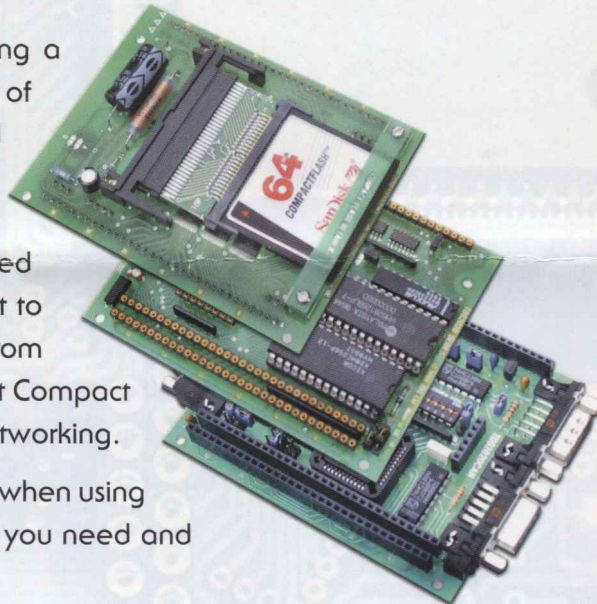
Embedded computers made easy

NEWSLETTER OF EMBEDDING COMPUTING

Weeks not Months

These embedded computers enable you to build equipment meeting exact requirements without having to be a computer expert.

We regularly see new users shipping a prototype within weeks of purchase of a Starter Pack. The TDS2020F and TDS9092 boards are intermediate between assembly from electronic components and purchase of finished equipment. You tailor an instrument to your needs, without having to start from scratch. This is the easiest way to get Compact Flash data collection or CAN bus networking.

No programming is needed when using the Datalogger Wizard. Tell it what you need and the software is written for you.

TDS2020F Starter Pack

The TDS2020F has a rewriteable flash memory so once you have compiled the program the system is ready to run. Use of flash technology means you can change the program remotely, even over a long distance telephone or radio link.

The Forth language on both boards is interactive making for fast learning and debugging, even if you never used the language before.

Ready-made software modules covering many applications from modems to touch-screens plug together with your own code to make the computer do exactly what you want.

THE FAST AND EASY WAY TO PUT COMPUTERS INTO INSTRUMENTS, PROCESS CONTROL AND DATA LOGGERS

Contact us for data sheets on the 16-bit TDS2020F or the 8-bit TDS9092.

I have been impressed with TDS and their products. They are the natural choice for us to use: versatile, easy to use, plenty of features, good quality, good technical support and Forth is easy to use and debug.

LK, Birmingham

Who are Triangle?

We have been making industrial Forth embedded computers for 20 years. A bought-in computer will save front-end costs and shorten product development times. Expertise in the application design is paramount, you don't need a computer specialist.
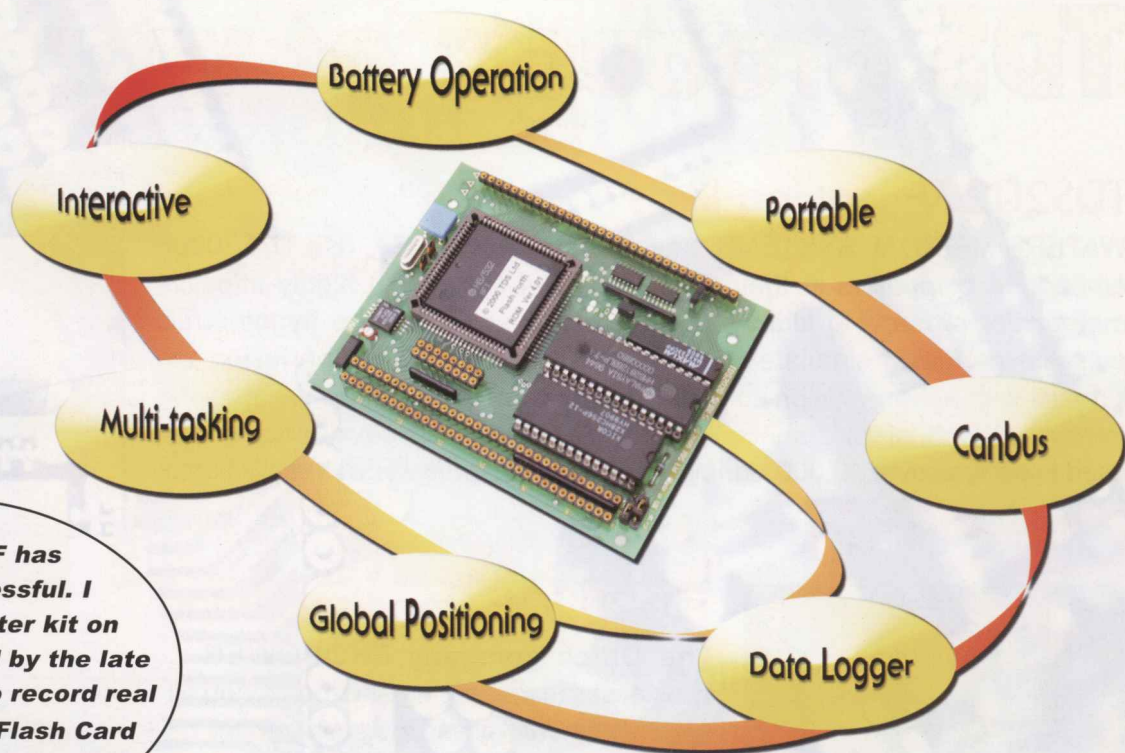
Stability is needed in these industrial markets. Many advertisements have come and gone for board computers—you will have seen them yourself—but we operate on a long-term basis and are a secure source of leading-edge product at good prices. You have unrivalled technical support during development. We designed both software and hardware so can answer all questions.

Choose your embedded computer ...

Feature	TDS2020*F*	TDS9092
Parallel Ports	26 - 41	35
Serial Ports (RS232 levels)	2	2
Max. SRAM (options available)	32k - 8M bytes	8k - 16k bytes
Max. non-volatile storage	1 gigabyte	32k bytes
Max. compiled program	45k bytes	30k bytes
10-bit A-D (channels)	8	0
8-bit D-A (channels)	3	0
I^2C serial bus	Yes	Yes
Real Time Clock	Standard	Optional
Matrix Keyboard Support	64	64
LCDs (Character & Graphic)	8 max.	8 max.
Power Supply	+6 to +16V DC	+6 to +16V DC
Power (typical)	31mA	15mA
Power (low power mode)	0.155mA	3.0mA
Microprocessor	Hitachi H8/532 (16 bit)	Masked HD6301 (8-bit)
Temp. Range	-10 to 70°C	-10 to 70°C
On Board High Level Language	16k ANS Forth	16k Fig-Forth
On Board Assembler	Yes	Yes
Extensive Existing Libraries	Yes	Yes
Floating Point	Optional (ANS)	Optional
Background Tasking	Yes	Yes
Pre-emptive Multitasking	Yes (optional)	No
Development Environment	PC	PC
Size	100 x 80mm	100 x 72mm
Mounting (2 options)	Pinheaders or DIN41612C	Pinheaders or DIN41612C
Starter Pack price	$445 £300 480€	$220 £150 240€
50 plus price	$199 £135 216€	$89 £60 96€

Battery Operation

Interactive

Portable

Multi-tasking

Canbus

Global Positioning

Data Logger

> *The TDS2020F has been very successful. I collected the Starter kit on Friday afternoon and by the late evening I was able to record real data to a Compact Flash Card*
>
> *TB, Cambridge*

Logging Global Positioning System (GPS) signals

The main features when used with GPS are:

- Log other data as well as location information
- Industry-standard PCMCIA and Compact Flash cards
- Low power
- Output to Excel spreadsheet or Access database
- Use any GPS receiver, or the Sapphire, shown below

Log longitude and latitude, date and time, speed, heading, pressures, temperatures etc. To recover data you can read the card in a PC directly into Excel spreadsheet. Or send it over a serial link to a remote computer.


Instant solutions

Software modules that easily connect can form the major part of your application program.

Analog input	Memory
Analog output	expansion
ANS Forth	Microphone
Audio	Modems
Battery power	Motor control
Benchmarks	Multitasking
CAN bus	Networking
Compact flash	NV-Memory
Control loops	Operator input
Data logging	Opto-isolation
Date & time	PC cards
Digital input	(PCMCIA)
Digital output	Portable use
EEPROM memory	Printers
FFTs	Protocol
Flash memory	conversion
Floating point	PROM
Forth extensions	programming
Frequency	Radio clock
GPS data logging	Regular events
GSM modem	Resource locks
Hard disks	Serial
I²C bus	communications
IEEE-488 bus	Shaft encoders
Integer maths	Speech
Interrupts	Stepper motors
J1939	Strings
automotive bus	System security
Keypads	Temperature
LCDs—CAD	sensing
LCDs—character	Timekeeping
LCDs—colour	Timer-counters
LCDs—graphic	Touch-screens
LCDs—pictures	Trigonometry
LCDs—touch	VGA screens
LCDs—VGA	Video
Light input	Watchdogs

TDS products at work

TDS2020*F* saving lives

WATERS MEDICAL SYSTEMS, based in Minnesota USA, use TDS2020*F* embedded computers in their RM3 Perfusion system—a highly effective method for preserving kidneys before transplantation. The hypothermic pulsatile perfusion simulates the action of the heart while perfusing the kidneys with a preservation solution. This improves their viability, improving the success rate of transplants. Waters Medical Systems devices have been used to perfuse over 40,000 kidneys since 1971. http://www.watersmed.com.
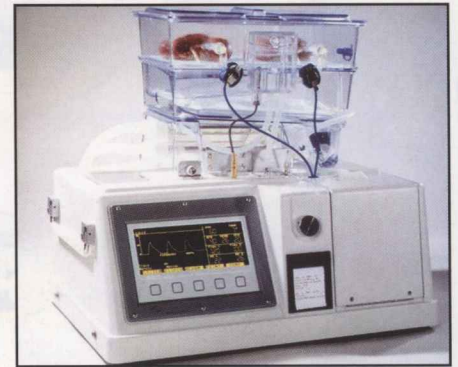
TDS2020*F* monitors wind

The Dutch company EKOPOWER specialises in measuring and monitoring systems for energy and the environment. They use TDS2020*F*s in their accurate and reliable Wind and Meteo Datalogger EKO21. These devices have wireless data communication options and automatic downloading to PC and internet. They are used all over the world and show how TDS2020*F* computers can function in extremes of temperature where not much power is available. http://www.ekopower.nl

Pigs use TDS2020*F*

A special range of pigs (pipe testing and cleaning devices) containing TDS2020*F* embedded computers were developed for STATOIL, a major Norwegian pipeline company, by John Plank at DWYRAN DESIGN AND DEVELOPMENT. The main criteria for the pigs were to negotiate the large change in gas pipe diameter and carry out a number of cleaning and gauging functions. The TDS2020*F* computers were inside a pressure vessel that had to withstand an external pressure of 100 bar as they logged peak deflection data. They took readings at 33ms intervals, and the peak deflection was recorded at one second intervals. Real time and peak deflection data were transferred to an 8 megabyte compact flash card in a TDS2020CM2 adapter for storage, with recovery being done in a PC. john@dwyran.com