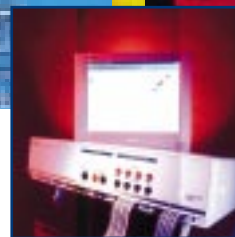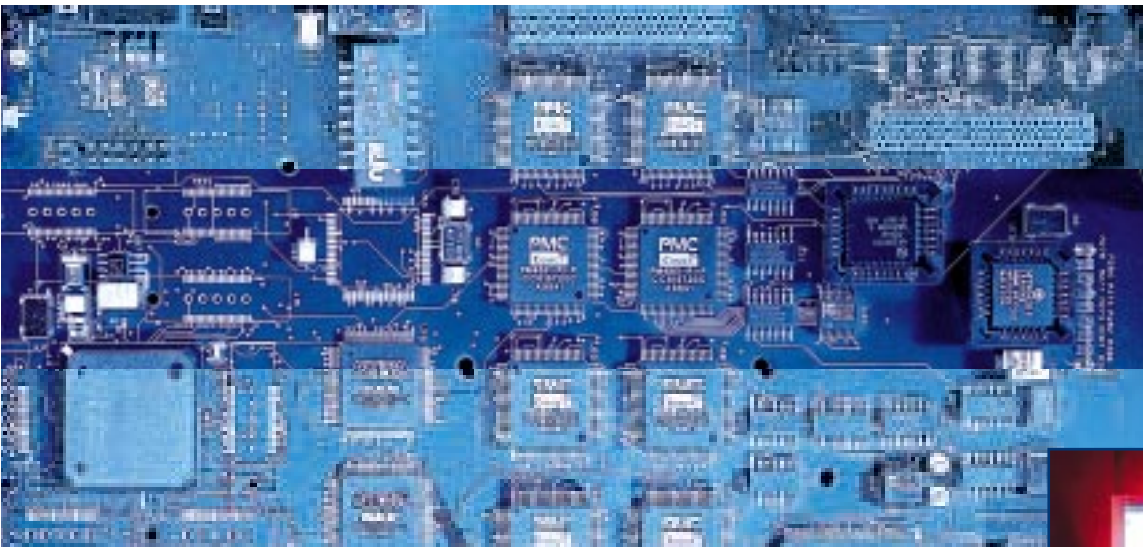# PFL780 & PFL760
PCB Fault Locators

*Successful Faultfinding
on assembled PCBs*

*Effective in Production &
Manufacturing*

Proven in Service & Repair

*Ideal for CEMs making
small to medium batches*

Polar

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MANUFACTURING & PRODUCTION OF PCBs.

Typical production and manufacturing departments have a small percentage of PCBs that require fault location to component level after assembly. Whether your volume is high or low, Polar's PFL Fault Locator can help you locate these faults rapidly and cost effectively

All over the world, the PFL is used in production to locate typical manufacturing faults including:

Missing components

Reversed components

Wrong value or incorrect type components

Shorts, opens

Unlike conventional test products used in manufacturing, you locate faults with the PFL on unpowered PCBs and there is no complex programming as used for ATE. Neither do you need electrical models for the components used on the PCB. We have many installations where the PCBs are produced in low volumes and the PFL is the only product used for finding faults. If you have ATE or similar in medium to high volume applications, the PFL is very successful at repairing PCBs rejected by ATE.

You will find the PFL very easy to use because of its graphical interface that displays a picture of the PCB and if you have CAD data, the FTCam option displays the full routing of defective traces over the board. Operators with limited technical knowledge can use the PFL in this application.

Nodal Impedance Test
This is made on unpowered PCBs. The PFL applies a current limited sinewave voltage and produces a graph of voltage against current for the node. The PFL will compare the nodal response of a defective PCB with that of a known good PCB previously learned and stored. It will automatically identify signatures that exceed a defined tolerance and identify components that are suspect. The PFL contains a range of different voltages, currents and frequencies suitable for exercising most types of components.

Scanner
The 128-pin scanner allows you to make up to 128 tests in a single pass. This is particularly valuable for nodal impedance tests on components with a high pin count or when exercising edge connectors.

SERVICE & REPAIR

When a PCB fails after months or years of correct operation, you will often need to identify the cause and repair it, especially when the board is part of a large and valuable piece of equipment. The PFL Fault Locator is designed to help in this application and is more effective than the traditional oscilloscope and DVM for finding this type of fault.
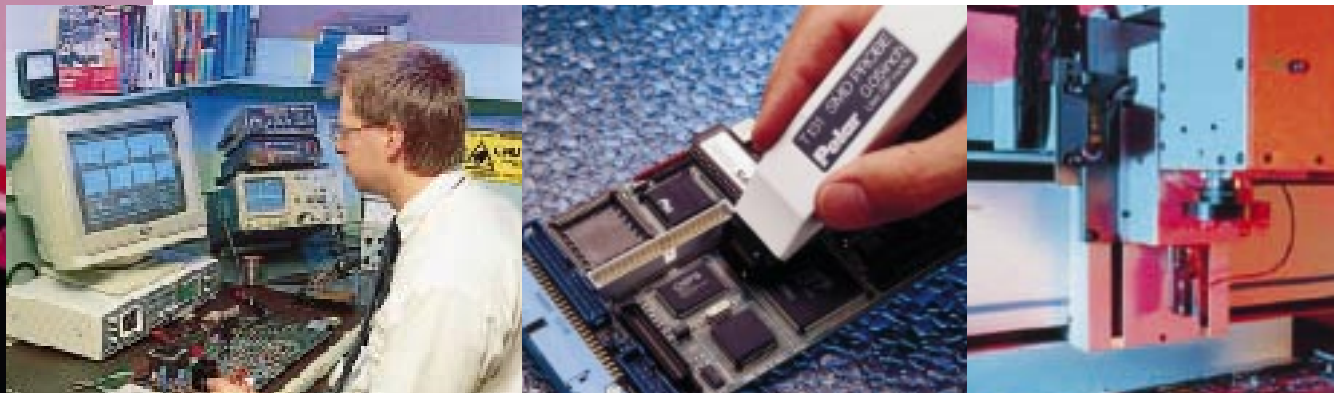
Digital Functional Test

The PFL780 contains a library of tests for common digital ICs (including 7400 and 4000 series) and applies a Functional Test to a powered IC. The PFL automatically adjusts the test parameters to allow for shorted pins, etc. and tests the device against its truth table, reporting a PASS or FAIL. The PFL can be programmed to automatically apply power to the PCB for the short duration of the Functional Test.

Links Test

The PFL can run a Links Test that will check for shorts and opens between the pins of the component being tested (e.g. pins shorted to Vcc or GND or gate inputs intentionally shorted). The results are displayed graphically and highlight any differences compared to the results from a known good PCB previously learned and stored.

Engineers and technicians can use the PFL to perform an In-Circuit Functional Test on many types of digital ICs supported by the PFL library as well as applying a Nodal Impedance Signature Test to any type of component. The functional test can identify a defective IC and the nodal impedance test will show a difference compared to a "gold PCB" that can indicate the cause of failure. These two test methods allow you to faultfind on PCBs containing all types of technology (e.g. from passives to ASICs) and in many cases, you can locate the fault without reference to circuit diagrams. Faulty transistors, FETs, SCRs and thyristors can be identified using the PFL pulser to stimulate the device's gate.

The benefits of finding the fault yourself include:

Independence from the original manufacturer

Cost saving

Faster repair time

The powerful software includes features that allow a skilled engineer to make a series of tests, interpret the results and pin point the cause of the fault.

GRAPHICAL SOFTWARE

PFL software is a true 32-bit application that provides a highly graphical interface that is easy and intuitive to use. This means that users can have different levels of experience for the various applications. A semi skilled operator can be highly effective with the PFL in Manufacturing & Production whereas a more experienced engineer will obtain most benefit in Service & Repair.

The screen will indicate the test status against each component and a device outline is shown for the component selected in the test list.

A picture of the PCB can be displayed within the PFL software and after placing a test clip on a component, the operator can run a test by clicking on the component's outline on the screen. Locating components is often much faster than using a list.

An engineer can display full details of the test results and use these to help analyse possible failure modes. Full digital information is displayed and nodal impedances for both the board being tested as well as the stored reference is shown.

For instances in Service & Repair when you only have one or two PCBs there is no need to write a test list. The PFL contains Live and Quicktest modes allowing you to see the nodal signatures for different test ranges and to check an IC against its truth table and display any linked pins.
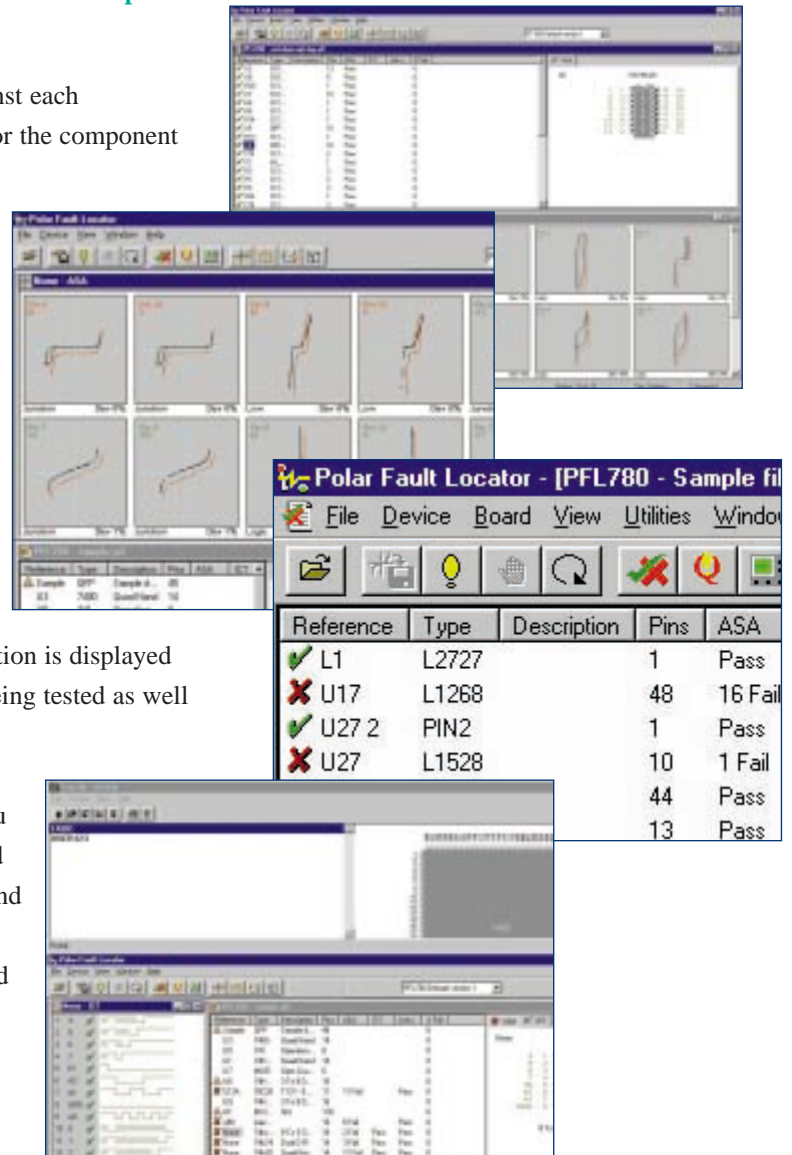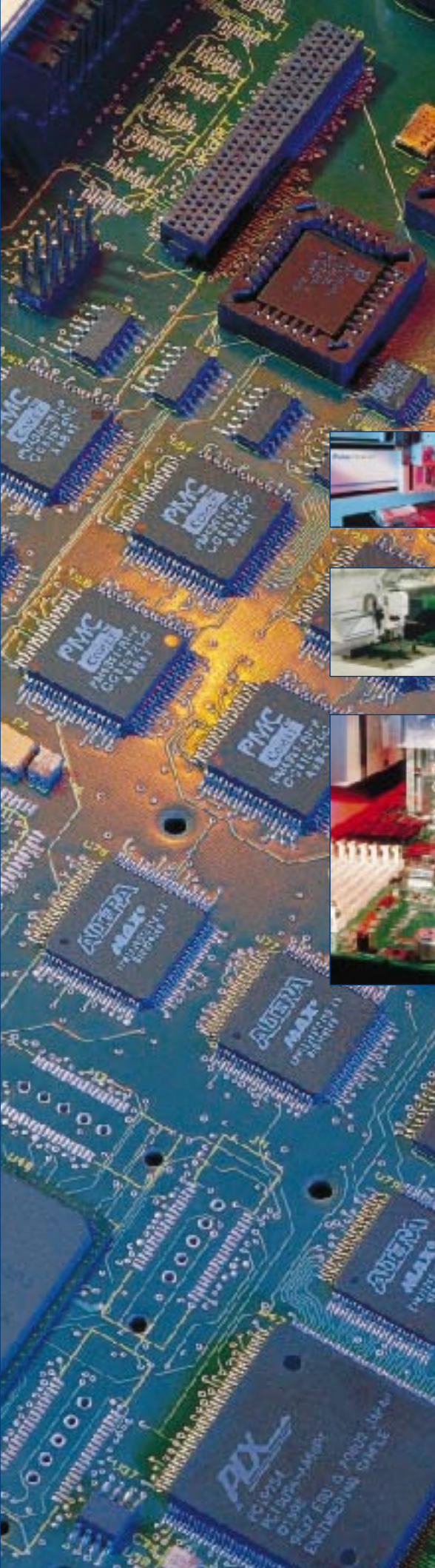
CAD DATA IMPORT

If you have CAD data, the optional FTCam software will import all of the details into the PFL. The software allows you to highlight one or more nodes and trace their path over the whole PCB identifying all components on a specific node. If two nodes are shorted, you can see the areas where they are close to each other.
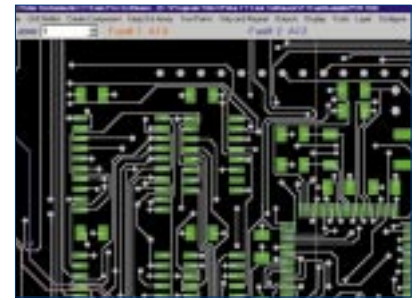
Connecting the PFL to components

Whether you are finding faults on older technology PCBs that have DIL (dual in line) ICs or have leading edge technology with SMT (surface mount technology), there is a wide range of test clips and probes to suit your application.

Conventional IC test clips support DIL, PLCC and QFP outlines.

There is also a range of handheld probes designed to fit components with lead pitches from 0.1" down to 0.4mm. A key feature of these probes is that they can be used on components with any outline (unlike conventional test clips).

For users who are regularly testing batches of the same PCB, the FT100 Flying Probe Test System is an ideal upgrade. You simply place the PCB in the prober and it will automatically probe all of the nodes checking their nodal impedance signatures and identifying differences. The FT100 is particularly used in Manufacturing and Production or in Service where there are regular quantities of the same PCB, particularly if the boards contain SMT devices. Further details are included in our FT100 brochure.

Tests	Nodal Impedance Test, In Circuit Digital Functional Test (PFL780), Links Test, Quicktest, Live (virtual instrument), PFL760 supports Nodal impedance (ASA) only
Channels	128
Test Ranges	1V/500µA, 10V/150mA, 20V/1mA, 40V/1mA at 90Hz, 500Hz and 2KHz TTL, CMOS user programmable levels
Pulse Generator	DC, 0 to +/-5V variable, variable width, pulse modes for Triacs and SCRs
User Power Supply	5V @ 5A (automatic control from ICT)
Guards	4 logic HI, 4 logic LO
Loop modes	Continuous, Loop until PASS, Loop until FAIL
Library	Extensive library supplied with PFL
Datalog	Comparison data stored for each device. Test list can be sorted against historical failure rate.
Foot Pedal	Supplied as standard
PC Requirements	WIN95, 98, NT, or XP 32Mb RAM, RS232 please indicate o/s when ordering.
Standard Accessories	40 way & 16 way test clips with leads Handheld probes, pulser leads, ICT power lead Operator Manual Power cord, RS232 cable
Approvals	ICT Test Time complies with International Defence Standard DEF 00-53/1 PFL conforms to applicable European Directives and is CE marked Polar Instruments Ltd is ISO9001 certified
Workstation	Ask for details of PWS9090 that includes a selected range of products

Optional Accessories

ACC139	Pack of 10 DIL clips with leads	0.3" – 8 pin, 14 pin, 18 pin, 20 pin, 22 pin, 24 pin, 28 pin 0.6" – 22 pin, 24 pin, 28 pin
ACC140	Pack of 6 DIL clips with leads	0.3" – 8 pin, 14 pin, 20 pin, 24 pin 0.6" – 24 pin, 28 pin
ACC160	Pack of 6 SO & SO(W) clips with leads	0.1" to 0.2" – 8 pin, 14 pin, 16 pin, 20 pin, 24 pin, 28 pin
ACC171	Pack of 7 PLCC clips with leads	20 pin, 28 pin, 32 pin, 44 pin, 52 pin, 68 pin, 84 pin
ACC178 *(Note probes may be ordered individually)*	SMD Probe Kit with carrying case	0.4mm/32 pins T141, 0.5mm/32 pins T140, 0.65mm/32pins T137, 0.8mm/16 pins T139, 1mm/14 pins T136, 0.025"/32 pins T138, 0.05"/11 pins T131 Small outline 0.05"/16 pins T201, 0.1"/20 pins T202
ACC166	Transistor probe	SOT23 transistor outline
ACC137	5 way connector	Allows 5 test clips (or equivalent) to be connected to PFL
ACC145	ZIF socket	Single 40 way ZIF socket connecting to PFL
T41282	2x64 way routing PCB	PCB connecting to 2x64 PFL channels, allows user to add own connectors, etc

HEAD OFFICE

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