Technical Specifications

SIGNAL INPUTS

Data Channels: 32

Clock Inputs: 3 independent clock inputs; active edge can be in - dependently selected for each to be either positive, negative or off.

Clock Qualifiers: 3 qualifier in puts, 1 for each clock. Selectable to be active high, low or don't care.

Input Characteristics: Determined by the type of pod fitted; requires either one AP01, or two AP03s plus one AP04, or two AP03Vs plus one AP04V. See PODS section.

Activity Indicator: Shows whether the channel input is high, low or switching.

MEMORY ORGANISATION

Data Memory Size: 32 bits x 2K words

Reference Memory: 32 bits x 2K words

Non-volatile Memory: Non- volatile storage for 10 acquisitions and 10 set-ups. Data retention typically 5yrs by lithium cell.

EXTERNAL CLOCK

Frequency Range: DC to 25MHz

Clock Pulse Width: 20ns minimum

Organisation: 3 clocks, individually qualified and ORed together.

Set- up & Hold Times: 18ns set- up, 0ns hold for both data and clock qualifiers.

INTERNAL CLOCK

Clock Rate: Selectable 40ns to 100ms (25MHz to 10Hz) in a 1:2:4 sequence with all pods. Additionally 10ns (100MHz) in high speed mode with high speed pod.

TRIGGERING

Sequencer Words: 4 words of up to 32 bits.

Sequencer Terms: The actual trigger term searched for in a sequencer step each consist of up to 4 trigger sequencer words ORed together.

Sequencer Steps: Each of up to 4 sequencer steps consists of a search for the trigger term specified in that step. Each step has an event count of 1 to 128 oc currences of the trigger term.

Trigger Position: Selectable to be from 0 to 5K clocks before the start, centre or end of store, set table in 1K steps.

Trigger Output: TTL level signal at rear panel BNC

GLITCH (Only available when high speed pods are fitted).

Number of Channels: 16 (8 per pod)

Detectable Pulse: 5ns minimum

Glitch Triggering: A glitch word can be specified which can be ORed with any trigger word within a trigger term.

TIMING DISPLAY

Number of Channels: TA320S - Any 6 channels may be displayed; channels may be repeated.
TA320PC - Any 16 channels may be displayed; channels maybe repeated.

Channel Labelling: A user- defined name can be given for each group of channels and each channel will be uniquely numbered within the group.

Number of Samples: The store can be displayed with expansions of x1,x2,x4,x8,x16. Window indicator shows position of window within the store and shows expansion. Expansion window scrolled through out store.

Cursors: Movable cursor and marker, with read out of store positions and data values. Marker moves to the trigger location following each acquisition.

Search: A search can be made for any word; the search word may in clude glitches.

Glitches: Shown by markers on the appropriate data channels.

LIST DISPLAY

Channel Groups: Up to 32 channels can be grouped to gether under a single character label for which a name can be defined. Up to 16 groups can be specified.

Display Format: Binary, Octal, Hex, Decimal or ASCII individually selectable for each channel group. Each group is listed under neath its label or name.

Cursors: A movable cursor and a fixed marker are provided.

Search & Compare: Differences between data and reference can be shown and a search made for any word and any difference. Automatic comparisons can be performed on a user specified area of the data and acquisitions stopped on an equality or inequality.

HARD COPY OUTPUT

TA320S/TA320PC: state and disassembler listings may be printed over any specified memory range. TA320PC only: all screens can be printed.

GENERAL

Input Voltage: 110/120 or 220/240 volts AC nomi nal 50/60Hz by rear panel adjustment.

Power Consumption: 25VA max

Operating Range: 5°C to 40°C, 20% to 80% RH.

Storage Range: -20°C to 60°C, 5% to 95% RH.

Size: 260(W) x 88(H) x 235(D)mm (10.2 x 3.4 x 9.2") ex-cluding handle and feet.

Weight: 1.9kg (4.2lb)

PODS

Combination pod AP01
Single pod with 32 data inputs (clock speed DC to 25MHz), 3 clock inputs, 3 qualifier inputs. Input impedance 100k Ω/10pF. Thresh old TTL (+1.4V). Three 30 inch out put cables for connection to TA320 Single 40 way in put connector with colour coded plug- on connection leads.

High speed data pods AP03/AP03V
16 channels or 8 channels with glitch capture (5ns) for clock DC to 25MHz, 4 channels at 100MHz clock (asynchronous only). Input impedance 100kΩ/6pF. Single 30 inch out put cable. Two 10 way in put connectors with colour coded plug- on connection leads.
Thresh old: AP03: fixed TTL (+1.4V), AP03V: variable -2.5V to +7.3V.

Clock pods AP04/AP04V
6 in put pod providing 3 clock inputs and 3 qualifier inputs. Input impedance 100kΩ/6pF. Single 30 inch output cable. Single 10 way input connector with colour coded plug- on connection leads.
Thresh old: AP04: fixed TTL (+1.4V), AP04V: variable -2.5V to +7.3V.

DISASSEMBLERS

Disassembler pods for a number of popular microprocessors are available including Z80, 8031/51, 8085, 8086, 8088, 6502. Disassembly software is up loaded from the pod.

OTHER ACCESSORIES

A range of options for easy connection to target systems is available.

Thurlby Thandar Instruments Ltd. operates a policy of continuous development and reserves the right to alter specifications without prior notice.

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THURLBY THANDAR INSTRUMENTS

TA320



32 channel low-cost logic analysers

100MHz, 5ns glitch capture, disassembler support

Choice of built-in screen or PC screen display

Logic Analysis from Thurlby Thandar

low cost needn't mean low performance !

a self contained instrument

or an add-on to a PC

Until now, buying a truly low cost logic analyser meant buying a very limited specification; a limited number of channels, limited speed, limited trigger capabilities and limited display facilities.

A specification far in excess of its price

The TA320 has a specification that meets the needs of all but the most demanding of applications. 32 data channels, 100MHz maximum acquisition speed, 5ns glitch capture and multi-level trigger sequencing.

An essential instrument within every area

The capabilities of a logic analyser have become important within virtually every area of electronics. Development, production, service and education all have a need for logic analysis but the high prices have discouraged many potential purchasers. Now TTi have made high performance logic analysers affordable.

A choice: Stand alone or PC linked

The TA320 is available in two versions.

The TA320S is a stand alone instrument with a built-in screen and key pad.

The TA320PC is an add-on to a personal computer. It links to the serial port of the PC and comes with software that enables the computer to provide display, control and data storage.

An easy to use instrument

Logic analysers can be daunting. The more sophisticated the instrument, the more difficult it can be to use.

TTi understand this problem, that's why the TA320 has simple and clear screens which can be understood at a glance.



32 channels and a 2K word memory

The TA320 has 32 data channels and a 2K word data acquisition memory.

This enables it to capture and analyse relatively complex data including disassembly of a range of popular microprocessors.

100MHz asynchronous acquisition

When making timing measurements you need as much speed as you can get, so the TA320 gives you a full 100MHz on 8 channels when used with high speed pods.

5ns glitch capture

Glitch capture allows you to see very short pulses which are beyond the resolution of the analyser's sample clock.

The TA320 enables you to detect glitches down to 5ns on 16 channels and provides glitch trigger, a very important facility for finding some types of fault.

Multi-level trigger sequencing

The most important requirement of a logic analyser is that it should capture exactly the data that you need. That requires sophisticated triggering. The TA320 gives you a four step sequencer with event counting and restart on each step. Trigger words are full width and the trigger position within the store can be varied.

Multiple clocks for complex synchronous capture

The TA320 has three external clock inputs each with its own qualifier selectable for active edge and active level respectively. This gives highly flexible clocking for synchronous data capture from DC up to 25MHz.

Non-volatile memories

Non-volatile storage is provided for 10 acquisitions and 10 set-ups (unlimited number on TA320PC). This ensures that reference data and commonly used configurations can be retained for future use.



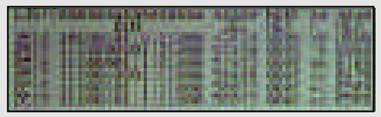
- *Choice of stand-alone or PC interfaced models*
- *32 data channels from DC up to 25MHz*
- *100MHz maximum asynchronous acquisition*
- *4 step trigger sequencer with delay and restart*
- *5 nanosecond glitch capture*
- *Non-volatile data and set-up memories*
- *Disassembler options for popular microprocessors*
- *Very low costs*



Comprehensive state listings

The state listing screen can be formatted exactly how you want it. Any number of channels can be grouped together under a label and displayed in any base.

Groups can be repeated in differing bases if required.



Powerful search and compare facilities

Differences between the data and reference memories can be shown. A search can be made for any word and any difference.

Automatic comparisons between the memories can be performed on a user specified area of the data and acquisition can be stopped on an equality or inequality.

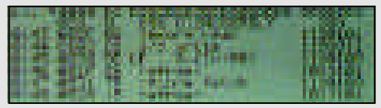


Hard copy output

For extra convenience captured data can be sent to a printer as hard copy for later analysis or permanent storage.

Disassemblers for popular microprocessors

The TA320 supports disassembly for a number of popular microprocessors. Disassembler pods have built-in firmware which is automatically up-loaded to the TA320 thus allowing disassemblers to be interchanged at will.



TTi - a track record in logic analysis

TTi have been designing and manufacturing logic analysers for more than a decade.

The TA320 is one of a family of analysers from a company who understands and supports logic analysis. TTi offers products with up to 80 data channels, up to 400MHz speed and disassembler support for complex microprocessors.

TA320 MODEL RANGE

TA320S

The TA320S is a self-contained logic analyser incorporating a high resolution LCD screen. The model specific features are as follows:

Display:
240 x 64 pixel graphic super twist LCD providing 40 characters x 8 lines in text mode. Timing display of any 6 channels at expansions up to x16. Full width list display of 32 channels in any base including binary.

Control:
Built-in key pad provides 6 soft function keys, 4 dedicated function keys, 19 alpha-numeric keys, 4 cursor control keys.

Interface:
RS-232 interface for remote control and data transfer. Baud rates 1200, 4800 or 9600. Interface conforms fully with the TTi ARC (Address able RS232 Chain) system. A serial to parallel converter cable is available to drive parallel printers.

TA320PC

The TA320PC is an adjunct to a personal computer and has neither a screen nor a keypad. The model specific features are as follows:

Software:
Disk based software (3.5" & 5.25 media) for any MS-DOS based computer with EGA graphics or above (inc. VGA & SVGA). Provides full control and display facilities for the logic analyser .Operation by mouse and/or keyboard.

Interface:
RS-232 interface with cable for connection to the serial port of the PC.

Display:
High resolution colour or monochrome display via computer monitor. Timing display of any 16 channels at expansions up to x16. Full width list display of 32 channels in any base.

Control:
Full operation from computer keyboard using function keys and cursor keys for control and alpha-numeric keys for data entry.

Data Storage:
Unlimited disk storage of data and set-ups.

TA-PC Link

Software package (with interface cable) which provides the TA320S with all of the PC interface features of the TA320PC.