2020A

2020A (and 2021A) Universal Printer

The Fluke 2020A is a 20-column thermal printer — the first printer with five interchangeable data interface options. Whether you need IEEE-488, RS-232-C, BCD, parallel ASCII, or Fluke's own Portable Test Instrument (PTI) polling interface, the 2020A has the option to match. To change interfaces in the field, all you need is a screwdriver and about 5 minutes. The only practical difference between the 2020A and the 2021A is that the 2021A operates only from a 5-volt dc supply whereas the 2020 operates from either the ac power line or a nominal 12-volt dc source.

Graphic Printing.

The 2020A with a parallel ASCII or IEEE-488 interface is capable of printing a dotted graph of incoming data. The data source must send the correct 8-bit binary code for trace-on, 0 through 99 for the dot location, line feed, and finally trace-off. Use this feature to plot trends and trace profiles in addition to normal print out.

PTI Polling

The 2020A's PTI polling interface contains a microcomputer with addressing intelligence designed to generate the assigned addresses of numerous instruments in the PTI family. Select a print mode and the 2020A automatically begins polling by sequentially sending addresses one through nine until a measurement instrument recognizes its address. The 2020A then prints both the address and the instrument's current reading.

Numerous other Fluke instruments will also work with the polling interface option using a Y2028 BCD Converter.

BCD Converter

The Y2028 Programmable BCD Converter with isolated output, links the 2020A to most Fluke instruments which have BCD outputs using your standard 2010A-7000 series Fluke BCD cables. One switch setting programs the Y2028 for your instrument, converting the incoming full parallel BCD data into character-serial ASCII. This allows access to either the parallel ASCII or the PTI polling interface.

Time Interval Printing

Fluke offers the 2020A with time interval printing (Option -006). it allows printing at preselected time intervals from ten seconds up to eight hours so you get printed data when you want it.

When you use the time interval print option and a PTI polling interface, the 2020A will automatically label the printer tape with elapsed time each time it prints a set of readings.

A typical polling system might include the 2020A with a 2190A Thermometer and a 8920A Voltmeter.
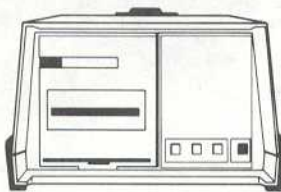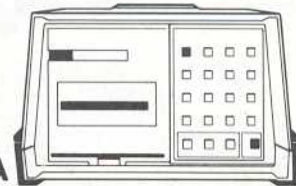
PRINTERS
Instrument Compatibility
2020A/2021A/2030A NEW

Your choice of five field-installable
interface options
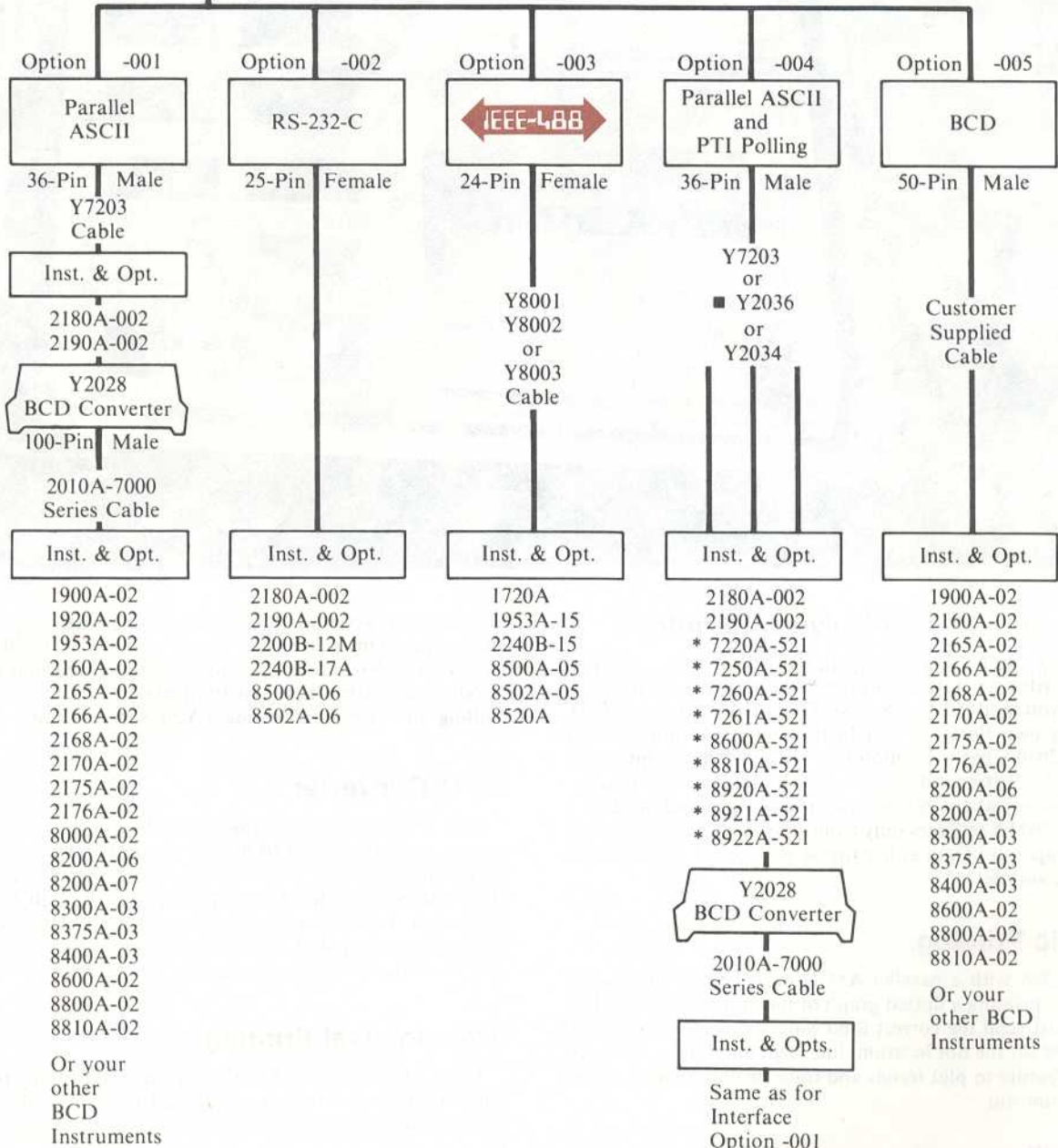
Compatible with same instruments as
2020A with Option -004

2020A or 2021A

2030A

One Interface Option

Option -001	Option -002	Option -003	Option -004	Option -005
Parallel ASCII	RS-232-C	◄IEEE-488►	Parallel ASCII and PTI Polling	BCD
36-Pin Male	25-Pin Female	24-Pin Female	36-Pin Male	50-Pin Male

Option -001:
Y7203 Cable
Inst. & Opt.
2180A-002
2190A-002
Y2028 BCD Converter
100-Pin Male
2010A-7000 Series Cable

Inst. & Opt.
1900A-02
1920A-02
1953A-02
2160A-02
2165A-02
2166A-02
2168A-02
2170A-02
2175A-02
2176A-02
8000A-02
8200A-06
8200A-07
8300A-03
8375A-03
8400A-03
8600A-02
8800A-02
8810A-02

Or your
other
BCD
Instruments

Option -002:
Inst. & Opt.
2180A-002
2190A-002
2200B-12M
2240B-17A
8500A-06
8502A-06

Option -003:
Y8001
Y8002
or
Y8003
Cable

Inst. & Opt.
1720A
1953A-15
2240B-15
8500A-05
8502A-05
8520A

Option -004:
Y7203
or
■ Y2036
or
Y2034

Inst. & Opt.
2180A-002
2190A-002
* 7220A-521
* 7250A-521
* 7260A-521
* 7261A-521
* 8600A-521
* 8810A-521
* 8920A-521
* 8921A-521
* 8922A-521

Y2028 BCD Converter

2010A-7000 Series Cable

Inst. & Opts.
Same as for
Interface
Option -001

Option -005:
Customer
Supplied
Cable

Inst. & Opt.
1900A-02
2160A-02
2165A-02
2166A-02
2168A-02
2170A-02
2175A-02
2176A-02
8200A-06
8200A-07
8300A-03
8375A-03
8400A-03
8600A-02
8800A-02
8810A-02

Or your
other BCD
Instruments

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* One Y7203 Cable supplied with -521 Option.

■ Y2036 not required to print the output of only one instrument. One Y2036 recommended for 2 or 3 instruments. Two Y2036's or one Y2034 required to poll up to 5 instruments. Two 2034's will let you poll from 6 to 9 instruments.

PTI Polling

```
   4          10.53    mV
 100    +    22.57    °C
   ET      00:03:05

   4          10.55    mV
 100    +    22.57    °C
   ET      00:03:00
```

Sample section of printed tape showing two readings 5 seconds apart. Reading from bottom to top: Elapsed time (ET) is 00 hours, 03 minutes, and 00 seconds. Address 1 Channel 00 is for the thermometer and address 4 is for the voltmeter.

Specifications

Type: Thermal, 20-column
Characters: 5 x 7 dot matrix
Print Rate: 3 lines per second maximum
Spacing: 6 lines per inch (2.4 per cm)
Paper: 2.5 in (6.3 cm) wide, 240-ft roll (74 m)
Advance: Stepping motor, belt drive
Temperature: 0°C to 50°C, operating; –20°C to +70°C, non-operating
Relative Humidity: ≤95%, 0°C to 25°C; ≤75% to 40°C; ≤45% to 50°C
Weight: Approximately 9 lbs with paper
Power (2020A): 11 to 15V dc, 90 to 132V ac, or 180 to 250V ac, switch-selectable, 47 to 440 Hz, 40W maximum
Power (2021A): Nominal 5V dc only. For general power 4.35 to 6.0V; for logic power 4.65 to 5.5V; 40W maximum
Size: Style D PTI Case — 13.1 cm H x 20.5 cm W x 32.7 cm L (5.15 in x 8.05 in x 12.85 in)
Remote Operation: Rear input, by external contact closure, TTL/DTL compatible
Standards: IEC 348, Protection Class 1

Options

Parallel ASCII Interface (-001)

Input Connector: 36-pin AMP CHAMP, male
Signals: Data, 8 lines; Data Valid; Data Acknowledge
Signal Levels: Data, positive True, ≥ + 3.5V. Data Valid, Data Acknowledge lines — negative True, ≤ + 1.5V
Character Set: 64 upper case ASCII plus °, f, k, m, n, p, Ω, s, μ, z
Graphic Printing: Dotted trace activated by receipt of the following binary-coded decimal numbers on incoming data lines: in-trace — 16, dot location — 0 through 99, line feet — 254, out-trace — 255.

RS-232-C Interface (-002)

Input Connector: Standard 25-pin, female
Signals: Transmitted Data, Clear to Send, Data Set Ready, Signal Ground, Received Line Signal Detector
Baud Rates: Switch-selectable for 110, 150, 300, 600, or 1200 baud
Character Set: 64 upper case ASCII plus °, f, k, m, n, p, Ω, s, μ, z
Buffer Storage: 32 characters

IEEE-488 Interface (-003)

Input Connector: Standard 24-pin, female
Signals: Per IEEE Std 488-1978
Modes: Listen only or Addressable Listen, Switch-selectable

Character Set: 64 upper case ASCII plus°, f, k, m, n, p, Ω, μ, z
Graphic Printing: Dotted trace activated by receipt of the following binary-coded decimal numbers on incoming data lines: in-trace — 16, dot location — 0 through 99, line feed — 254, out-trace — 255.

PTI Polling Interface (-004)

Multi-Instrument Scanning: Up to nine Fluke measurement instruments with each having an internal preset address as follows: Adr 1 — 2180A, 2190A, Y2028; Adr 2 — 7250A, 7260A, 7261A; Adr 3 — 7220A; Addr 4 — 8920A, 8921A, 8922A; Adr 5 — 8600A, 8800A, 8810A; Adr 6, 7, 8, 9, — 2180A, 2190A, Y2028
Input Connector: 36-pin AMP CHAMP, male
Cable: Y7203, Y7204
Signals: Data, 8 lines, Address, 4 lines; Address Valid; Data Valid; Data Acknowledge; Scan in Progress
Character Set: 64 upper case ASCII plus °, f, k, m, n, p, Ω, s, μ, z
Buffer Storage: 1 line of data

Parallel BCD Interface (-005)

Input Connector: 50-pin AMP CHAMP, male. mating female connector included
Signals: Data, 44 lines; Busy; Trigger Out, 2 lines, positive or negative true
Signal Level: ≥ 3.5V positive True, TTL, DTL, CMOS B series
Decimal Point: Either fixed location (switch-selectable) or remotely BCD programmed, determined by jumper position
Column Usage: Either 7 columns of data and 4 colums of annotation with switch-selectable decimal point or 7 columns of data and 3 columns of annotation with programmable decimal point position, jumper selectable
Buffer Storage: 1 line of data

Time Interval Print (-006)

Print Intervals: Choice of 10, 20, 40, or 80 seconds, 1, 2, 4, 8, 10, 20, 40, or 80 minutes, or 1, 2, 4, or 8 hours
Time Annotation: Elapsed time printed with each reading when Option -004 installed
Clock: Internal, crystal-controlled

Y2028 BCD Converter

Designed to accept full-parallel BCD input signals and convert them to 8-bit parallel, character-serial ASCII signals. Compatible with 202XA-001, 202XA-004 Interfaces and 2030A Printers.
Input: 100-pin edge-card connector plug compatible with 2010A-7000 Series cables
Input Signals: Parallel 8-4-2-1 BCD
Output: Attached ribbon cable with 36-pin AMP CHAMP connector, female. Optically isolated

Y2034 Multi-Instrument Interconnect

Provides mechanical connection point for interconnecting cables when 2 to 5 instruments are being scanned. For more than 5 instruments, 2 Y2034's are required.

Passive device with all corresponding connector pin numbers 1 though 18 wired in common. Pins 19 through 36 are open.

PRINTERS
2020A/2030A NEW

Models

2020A[1] Printer $595
2021A[1] Printer 545

Options*

202XA-001[2] Parallel ASCII Interface 150
202XA-002 RS-232-C Interface 225
202XA-003 IEEE-488 Interface 250
202XA-004[2] PTI Polling Interface 200
202XA-005 Parallel BCD Interface 275
202XA-006 Time Interval Print 150

Field-installable. Cables not included.

Accessories

Y2028[3] BCD Converter 350
Y2034[4] PTI Interconnect 195
Y2036[4] Cable-Adapter 80
Y7203 2-ft Cable, 36-Pin, PTI 45
Y7204 5-ft Cable, 36-Pin, PTI 60
Y8001 1-meter IEEE Cable 75
Y8002 2-meter IEEE Cable 80
Y8003 4-meter IEEE Cable 95
Y2035 Thermal Paper, box of 10 rolls 30
See page 152 for more accessory information.

[1] Each printer requires one interface option and can only use one at a time.
[2] Accepts Y7203 or Y7204
[3] A 2010A-7000 Series Interface Kit should be ordered to correspond with the Fluke instrument type to be used.
[4] Used when 2 or more PTI instruments are to be simultaneously connected to 2020A or (2021A) via Option -004.

2030A

A Computing Printer

The 2030A is a 20-column thermal printer with computing power. It combines standard printing performance with a multitude of other special features. First, it is part of the rapidly expanding PTI (portable test instrument) family of Fluke instruments. It is capable of mathematically manipulating data and automatically documenting the printed results. It can translate numeric data into a visual analog trace, and it can apply limits and activate alarms. The 2030A prints data in any one of seven modes—from a single reading to programmed printing at periodic intervals.

Seven Print Modes

Trace: Data graphically plotted between programmable limits
Trace Interval: Graphic trace of data plotted at programmed time intervals
Interval: Prints at programmed intervals
Interval Limit: Prints at programmed intervals and monitors for alarms when not printing
Single: Prints one reading when pushbutton is pushed
Continuous: Continuously prints up to three readings per second
Remote: Prints continuously when activated (via rear panel)

Time Interval Printing

Inside the 2030A is a precision crystal measuring time and allowing you to control when data is printed. A 99-hour clock is set from the front-panel keyboard; elapsed time starts automatically when the power is turned on. Either way, the 2030A prints only as often as you want — from once per second to 99-hour intervals. The 2030A automatically annotates the tape with the selected time and interval each time it prints data.

Multi-instrument Scanning

The 2030A's microcomputer contains addressing intelligence designed to generate the assigned addresses of many PTI family instruments (and others, through the Y2028 BCD Converter). Select a print mode and the 2030A automatically begins scanning by sequentially sending addresses one through nine until a measurement instrument, connected in parallel with others, recognizes its address. The 2030A then prints both the address and the instrument's current reading, and polls the next instrument having a higher address.

See page 10 for a list of compatible instruments.

A typical printing system might include the 2030A with a 2190A Thermometer and an 8920A Voltmeter.

One special instrument address may be reserved for math, limits, units, and trace operation.

One or more Y2036 Cable-Adapters are needed for printing the outputs of more than one instrument.

Math Power

Simply enter two 6-digit constants from the front panel and the printer can calculate the difference (delta) or percent difference (% delta) between a preselected reference value and the input data.

You can also program the 2030A to scale the incoming data, even with an offset value, and document the result with appropriate engineering units. You could, for example, correlate voltage and pressure, converting a range of 4-20 mA into 0-100 PSI.

Graphic Printing

Select the range of data you want to analyze and the 2030A will plot a dotted graph over a 2 1/8" full scale band of the tape. Simply program the right and left limits of the graph area as if they were 0% and 100%. Whether the measurement range is "0 to 1000" or "500 to 510", the 2030A automatically expands or contracts the range to fit within the 2 1/8" scale, and dot by dot plots a graph of the data you're recording.

Alarms

To control and monitor processes, the 2030A gives you the ability to continuously compare the reading of a measuring

instrument against two programmable limits with six-digit resolution. If the reading exceeds either the high or the low limit, the 2030A prints the reading, the time, and activates an alarm output.

When the 2030A is in its trace mode, the edges of the graph also act as alarm set points.

Engineering Units

The 2030A can be programmed to annotate data with the engineering units you choose. It overrides the basic measuring instrument's units with four alphanumeric symbols. Use this feature for math scaling and offset to put converted data in the proper units, or to indicate % when printing percent or difference (% delta).

Mode and Function Identification

Each print mode and special function has a distinct label. At the beginning of each print cycle, the 2030A automatically prints the appropriate labels so you know just what operations are to be performed. In the "interval limit" mode, for example, the 2030A prints Hi and Lo followed by the values assigned to each limit.

All labels include real time or elapsed time when in use, instrument address, and a 6-digit header (HD) to indicate the month, day, and year or other meaningful documentation. The diversity of symbols and special diagnostic messages add up to data that's easy to interpret today or weeks from now.

Specifications

Printer Type: Thermal, 20-column
Characters: 5 x 7 dot matrix
Character Set: 64 upper case ASCII plus °, f, k, m, n, p, Ω, s, μ, z
Print Rate: One line for each linefeed command, 3 lines/second max. A **Spacing:** 6 lines per inch (approximately 2.4 lines per cm)
Paper: 2.5 inches wide, 240-foot roll.
Paper Advance: Stepping motor, belt drive
Buffer Storage: 1 line of data
Decimal Point: Automatically printed in correct location
Print Head Test: Test pattern printed in all columns if paper advance depressed within 1 second of power turn on
Print Modes: SINGLE, CONTINUOUS, INTERVAL, INTERVAL LIMIT, TRACE, INTERVAL TRACE, and REMOTE (operated by contact closure, TTL- or DTL-compatible).
**Programmable Units:** Up to four characters programmed from front panel. Code set is 64 upper case ASCII characters plus °, f, k, m, p, Ω, s, μ and z. Overrides incoming units
Programmable Parameters: Time, Interval, Header, A constant, B constant, Hi Lim, Lo Lim, Units, Spec Adr. All are programmed from front panel.
Clock: Internal crystal. Will measure time intervals and either elapsed time or real-time. Resolution is one second; range is 99 hours, 59 minutes, and 59 seconds. Four modes: Elapsed time only, real-time only, elapsed time and time interval, or real-time and time interval. Real-time runs continuously and elapsed time is reset at the start of each print cycle.
Alarm: Two 6-digit setpoints, assignable, corresponding to six least significant digits of any one measurement instrument. Output is open collector, 28V max. Sinks 30 mA max.
Graphic Printing: Trace is programmed by proper selection of A and B constants. Operates on one instrument. Graph scale is 2 1/8 inches (100 dots) wide. Ten percent scale markers printed.
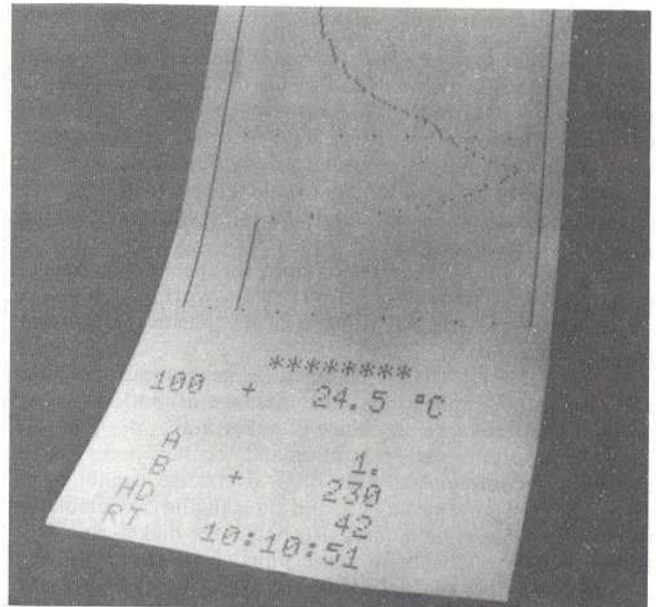
Graphic Printing

Accuracy ±2% of graph scale.
Math: Programmable to do scaling, delta, and % delta computations by proper selection of A and B constants. Operates on one instrument. Six-digit printout, maximum. Accuracy dependent on scale selected.
Multi-Instrument Scanning: Up to nine Fluke measurement instruments with each having an internal preset address as follows: Adr 1 —2180A, 2190A, Y2028; Adr 2 —7250A, 7260A, 7261A; Adr 3 — 7220A; Adr 4 — 8920A, 8921A, 8922A; Adr 5 — 8600A, 8800A, 8810A; Adr 6 —2180A, 2190A, Y2028; Adr 7, 8, and 9 —Indirect Addresses
Interface: Through 36-pin AMP CHAMP, male connector. Signals: Data, 8 lines; Address, 4 lines; Address Valid; Data Valid; Data Acknowledge; Scan in Progress.
Standards: IEC 348 Protective, Class I
Temperature: 0°C to +50°C, operating; –20°C to +70°C, non-operating
Relative Humidity: ≤95%, 0°C to 25°C; ≤75% to 40°C; ≤45% to 50°C
Size: PTI style D case — 13.1 cm H x 20.5 cm W x 32.7 cm L (5.15 in x 8.05 in x 12.85 in)
Weight: approximately 9 lbs. with paper
Power: 11 to 15V dc, 90 to 132V ac, or 180 to 250V ac, 47 to 440 Hz, 40VA maximum

Model

2030A[1] Printer $995

Accessories

Y2028[2] BCD Converter 995
Y2034[3] PTI Interconnect 195
Y2036[3] PTI Polling Cable 80
Y7203 2 ft Cable, 36 pin PTI 45
Y7204 5 ft Cable, 36 pin PTI 60
Y2035 Thermal Paper, box of 10 rolls 30
See page 152 for more accessory information.
[1] Interconnecting cables not included. Order separately.
[2] A 2010A-7000 Series Interface kit should be ordered to correspond with the Fluke instrument type to be used.
[3] Required when 2 or more measurement instruments are simultaneously connected to the 2030A.