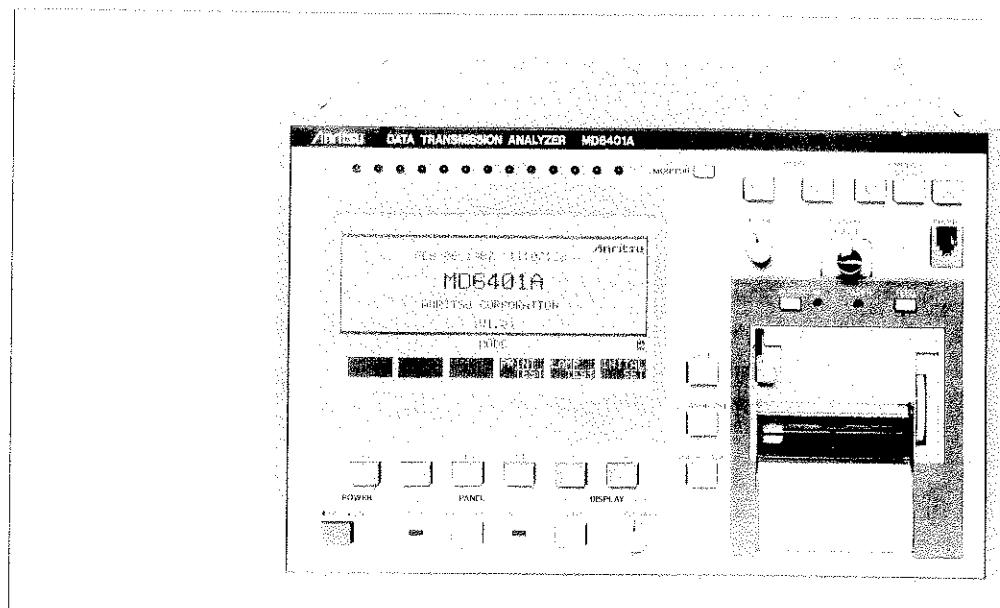


■ DATA COMMUNICATIONS & ISDN MEASURING INSTRUMENTS

DATA TRANSMISSION ANALYZER MD6401A



◀ GP-IB ▶

Data communications are faster and widely used in multi-media. Therefore, typical VAN network systems will become more diversified and complicated. Various measuring instruments are thus required for the development, manufacture, maintenance, and troubleshooting of data communications equipment according to measurement items. MD6401A is an integrated measuring instrument with functions required for measuring data communications equipment. It has been made light-weight and compact. Accommodations for future interfaces have also been considered.

Features

• Various plug-in units provided

The various interfaces that are currently being used, such as the V.24 (RS-232C), V.35, V.36 (RS-449), X.20, X.21, and G.703, can be used simply by exchanging the plug-in units. Since up to five units can be mounted, the MD6401A is ideal for the maintenance of multi-media multiplexing devices that support various interfaces. The flexibility of the MD6401A is such that newly developed interfaces can be used simply by exchanging the plug-in units.

• Devices from low-speed modems to high-speed digital lines

The MD6401A can handle interfaces having a bit rate of 50 b/s to 10 Mb/s.

• The error rate and performance can be measured and displayed simultaneously

The error count (bit error, parity error, CRC error, etc.), error rate, block error count, block error rate, ES, %ES, DM, %DM, SES, %SES US and %US can be measured simultaneously. In addition, since the measurement values of three items (optional) can be displayed simultaneously, the line state can immediately be known.

• Measurements between interfaces where sending and receiving differ can be performed

The MD6401A can separately specify the plug-in units of the sending and receiving systems so that the interfaces of the different systems can be measured.

• Abundant signal generation

The MD6401A can generate codes (A, Z, 1:1, 1:3, etc.), programmable patterns, eight pseudorandom patterns, word patterns (8 to 8 k words), FOX patterns (conforming to CCITT), voices (analog 4 kHz digitalization), and 1 kHz tone signals (64 kb/s digital).

• The receiving signal contents are self-evident—pattern trace function

The MD6401A traces a maximum of 32 kbyte patterns and prints them in HEX, ASCII, JIS8, and EBCDIC codes.

• Complete measurements by one-touch operation

The MD6401A uses keys to measure the frequency, pulse count, logic, and time of each signal line for a one-touch operation.

• Abundant measuring plug-in units provided

In addition to the interface unit, several plug-in units for executing the functions such as distortion measurements and generation of digital voices are provided.

• Voice communications also enabled

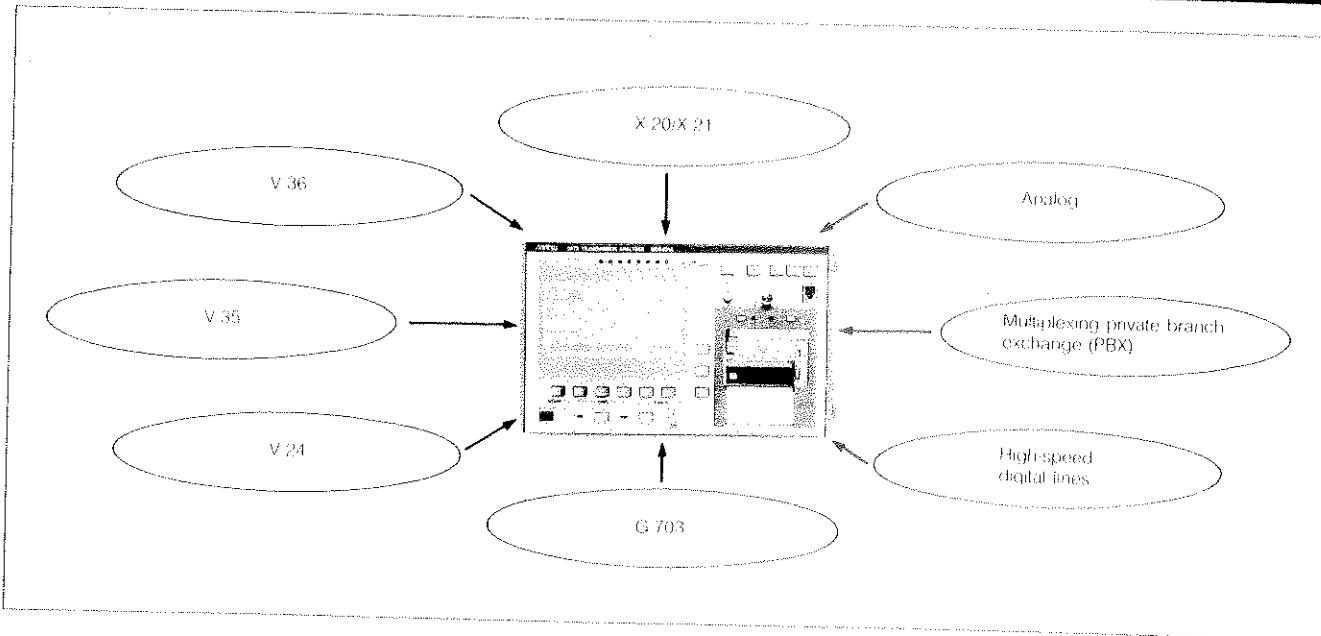
The MD6401A can send voices. A monitor function using a loudspeaker is also provided.

• Remote-control

The MD6401A has plug-in units for using the GP-IB, RS-232C, and V.11 for remote controls.

• Built-in printer

The MD6401A prints the measurement conditions, intermediate measurement process, and measurement results together with the test results.



Plug-in units

• X/V series interface

Model	Unit name	Remarks
MD0601A	V.24/V.28	V.24/V.28 interface
MD0601B	V.35	V.35 interface
MD0601C	V.36	V.36 (RS 449) interface
MD0601D	X.20/X.21	X.20 (RS 423)/X.21 (RS 422) interface

• G.703, AMI Interface

Model	Unit name	Remarks
MD0602A	64 K	64 K (AMI) centralized clock interface
MD0602B	1.544 M BIPOLAR	1.544 M (G.704, AMI/B8ZS) interface
MD06020	6.312 M BIPOLAR	6.312 M (G.704, AMI/B8ZS/B6ZS) interface
MD0602E	64 K G.703	64 K (AMI) codirectional/contradirectional centralized clock interface
MD0603A	2.048 M BIPOLAR	2.048 M (G.704, AMI/HDB3) balanced interface
MD0603A1	2.048 M BIPOLAR	2.048 M (G.704, AMI/HDB3) unbalanced interface
MD0603B	8.448 M BIPOLAR	8.448 M (G.741, AMI/HDB3) interface

• TTL interface

Model	Unit name	Remarks
MD0606A	TTL	50 Hz to 10 MHz (TTL) interface

• CMI, high-speed digital and PBX interface

Model	Unit name	Remarks
MD0604A	80 K CMI	80K (CMI) interface
MD0604B	1.544 M CMI	1.544 M (CMI) interface
MD0604C	2.048 M CMI	2.048 M (CMI) interface
MD0604D	6.312 M CMI	6.312 M (CMI) interface

• Analog interface

Model	Unit name	Remarks
MD0607A	ANALOG	Generates sine waves and voice and measures of levels and frequency

• Measurement extension units

Model	Unit name	Remarks
MD0610A	DIST	For single point distortion and bias distortion measurements
MD0610B	CODEC	For digital level measurements
MD0610C	64 K CLK	For 68 K + 8 K (AMI) clock generation
MD0610D	WORD MEM	For word pattern memory

• Remote-control units

Model	Unit name	Remarks
MD0620A	GP.IB	For GPIB remote control
MD0620B	RS-232C	For RS 232C remote control

• Interface test units

Model	Unit name	Remarks
MD0611A	INF-T (V.24/V.28)	For voltage, current and resistance measurement at V.24 interface
MD0611B	INF-T (V.35)	For voltage, current and resistance measurement at V.35 interface
MD0611C	INF-T (V.36)	For voltage, current and resistance measurement at V.36 interface
MD0611D	INF-T (X.20/X.21)	For voltage, current and resistance measurement at X.20/X.21 interface

■ DATA COMMUNICATIONS & ISDN MEASURING INSTRUMENTS

Specifications

Sending clock signal	Internal clock signal (ST1, ASYNC, ST/SP)	Frequency	50 to 20 kb/s in 5 b/s steps, 20 k to 400 k b/s in 100 b/s steps 512 k, 1024 k, 2048 k, 4096 k, 8192 k b/s
	Accuracy	Self oscillation: ± 5 ppm Slave oscillation: Subject to 8 k b/s or 8 k b/s of (64 k + 8 k) external input Slave oscillation range: $\geq \pm 100$ ppm	
	External input	Operated by the external input clock signal (TTL level or sine waves)	
External clock signal (ST2)		Clock (inversion can be used) by each 50 b/s to 10 Mb/s interface	
External clock signal (RT)		Clock (inversion can be used) by each 50 b/s to 10 Mb/s interface	
Receiving clock signal	Internal clock signal (ASYNC, ST/SP)	Code	50, 75, 100, 110, 150, 200, 256, 300, 400, 500, 600, 768, 800, 1 k, 1.2 k, 1.6 k, 1.8 k, 2 k, 2.4 k, 3 k, 3.6 k, 4.8 k, 7.2 k, 9.6 k, 14.4 k, 19.2 k b/s
Pattern	Programmable pattern	Code	A, Z, 1:1, 3:1, 1:3, 4:1, 1:4, 7:1, 1:7
	Pseudorandom pattern	Code	8 bit repetition (5 to 8 bits for ST/SP)
	Word pattern	Code	2 ⁿ - 1 bits repetition (n: 6, 7, 9, 11, 15, 19, 20, 23), positive/negative logic
	FOX pattern	Code	8 bits x 8 k words (manual input, remote setting, user's pattern)
Error insertion	Manual error	Code	Conforms to CCITT
	Cyclic error	Code	Single-bit error whenever the key is pressed or single-bit error every second
Start/stop synchronization	Start/stop bit length	Code	2.5×10^{-1} to 1.7×10^{-7} (N $\times 10^{-6}$ N: 1.0, 1.1, 1.3, 1.5, 1.7, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0)
	Data length	Code	5, 6, 7, and 8 bits
	Parity	Code	None, odd, even
Error measurement	Detection error	Code	Bit error, code error, parity error, and CRC error are selected.
	Measurement items	Code	Error count, error rate, block error count, block error rate, ES, %ES, DM, %DM, SES, %SES, US, %US
	Block length	Code	2 ⁿ to 2 ¹⁶ bits or 10 ³ to 10 ⁶ bits
	Measurement time	Code	10 ⁻² to 10 ⁶ bits measurement and repetition of 10 s to 999 hr 59 min, 59 s and 10 s to 999 hr 59 min, 59 s
Pattern trace	Display of measurement results	Code	Among the measurement results, three optional items can be displayed simultaneously. The buzzer sounds if an error is detected (the volume can be adjusted). The lapse time after the measurement starts is displayed in units of seconds
	No. of trace bytes	Code	32 kbyte max.
	Trace stop trigger	Code	Manual, code detection, not code detection, signal lines ON/OFF, No. of trace bytes, external input signal ON/OFF
	Delay trace after trigger detection	Code	0 to 8000 bytes
	Trace data display	Code	Displays together with trace stop time in HEX, JIS8, ASCII, EBCDIC, EBCDIK
Voltage measurement	Measuring range	Code	30 to +30 V
	Error	Code	$\pm 5\%$, ± 1 digit
Frequency measurement and count	Measuring range	Code	DC to 10 MHz
	Error	Code	± 5 ppm, ± 1 digit
	Display	Code	Decimal 7 digits
Time measurement	Measuring range	Code	0 to 10 s (10 μ s steps)
	Error	Code	± 5 ppm, ± 1 digit
	Display	Code	Decimal 7 digits
Signal monitor	Monitor lamp	Code	Displays the status of each signal line ("1", "ON", Green; "0", "OFF", Lamp off)
	Monitor terminal	Code	Outputs signal lines to monitor terminals
Error output	Error output	Code	Issues error pulse at TTL level
	Clock signal output	Code	Issues receiving clock or sending 8 kHz clock signal
Print output	At start of measurement	Code	Prints measurement conditions and time at start of measurement
Printing in error measurement	During measurement	Code	Prints time and error count in 1 second Prints time and measurement result after start of measurement Prints time and error count if an error occurs at termination of each measurement cycle
	At end of measurement	Code	Prints time and measurement result at termination of measurement
	Other printing	Code	Prints measurement conditions, measurement results, and time in manual measurement
Internal timer		Code	Year, month, day, hour, minute, second
Power		Code	AC 85 to 132 V/170 to 250 V (changeable), 47 to 63 Hz, ≤ 50 VA
Rated operating temperature range		Code	0° to 50°C
Connectable units		Code	5 units max
Dimensions and weight		Code	177H x 284W x 351D mm, approx. 8.5 kg (including printer)

■ DATA COMMUNICATIONS & ISDN MEASURING INSTRUMENTS

Ordering information

Please specify model/order number, name and quantity when ordering.

Model/Order No	Name	Remarks
MD6401A	Main frame Data Transmission Analyzer	
J0385 F0013 Z0031A W0128AE	Standard accessories Power Cord, 2.5 m Fuse, 5 A. Printer Paper. MD6401A Operation Manual	1 pc 2 pcs 2 rolls 1 copy T5A250V
B0250A B0250B B0252 B0025 B0253 A0006 B0254A B0254B J0386 B0215	Applicable products Carrying Case Carrying Case Carrying Bag Front Cover Unit Housing Case Headset Blank Panel Blank Panel External Input Probe Rack Mount Kit	Accommodates main frame and 11 units
Z0031A	Consumable Printer Paper	Accommodates 10 units
MD0601A	V.24/V.28 Interface Unit	For remote unit
W0129AE	Standard accessory MD0601A Operation Manual	1 copy
J0387 J0388	Optional accessories Double-ended 25-pin Cable, 2 m 25 pin DCE-DTE Conversion Adaptor	Used for DTE mode
MD0601B	V.35 Interface Unit	
J0389 J0390	Standard accessory MD0601B Operation Manual	1 copy
MD0601C	Optional accessories Double-ended 34-pin Cable, 2 m 34-pin DCE-DTE Conversion Adaptor	Used for DTE mode
W0131AE	V.36 (RS 449) Interface Unit	
J0391 J0392	Standard accessory MD0601C Operation Manual	1 copy
J0393	Optional accessories Double-ended 37-pin Cable, 2 m 37-pin DCE-DTE Conversion Adaptor	Used for DTE mode
MD0601D	X.20/X.21 Interface Unit	
W0132AE	Standard accessory MD0601D Operation Manual	1 copy
J0393	Optional accessory Double-ended 15-pin Cable, 2 m	
MD0602A	64 K Interface Unit	
W0133AE	Standard accessory MD0602A Operation Manual	1 copy
J0395	Optional accessory Balanced Cable, 2 m	E214APS → M1PS
MD0602B	1.544 M Bipolar Interface Unit	
W0134AE	Standard accessory MD0602B Operation Manual	1 copy
J0393 J0440	Optional accessories Double-ended 15-pin Cable, 2 m Balanced Cable, 2 m	
MD0602D	6.312 M Bipolar Interface Unit	
W0430AE	Standard accessory MD0602D Operation Manual	1 copy
J0393 J0427B	Optional accessories Double-ended 15-pin Cable, 2 m Coaxial Cable, 1 m	BNC-P•RG-58A/U•BNC-P

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Model/Order No	Name	Remarks
MD0610B	CODEC Unit	
	Standard accessory	
W0433AE	MD0610B Operation Manual	1 copy
MD0610C	64 K CLK Unit	
	Standard accessory	
W0429AE	MD0610C Operation Manual	1 copy
	Optional accessories	
J0162A	Balanced Cable, 1 m	M 3912--M 3912
J0162B	Balanced Cable, 2 m	M 3912--M 3912
J0162C	Balanced Cable, 2.5 m	M 3912--M 3912
J0162D	Balanced Cable, 5 m	M 3912--M 3912
MD0610D	Pattern Word Memory Board	
	Standard accessory	
W0434AE	MD0610D Operation Manual	1 copy
MD0611A	V 24/V 28 Interface Test Unit	
	Standard accessory	
W0434AE	MD0611A Operation Manual	1 copy
	Optional accessories	
J0387	Double-ended 25 pin Cable, 2 m	
J0387B	Double-ended 25 pin Cable, 0.3 m	
MD0611B	V 35 Interface Test Unit	
	Standard accessory	
W0435AE	MD0611B Operation Manual	1 copy
	Optional accessories	
J0389	Double-ended 34 pin Cable, 2 m	
J0389B	Double-ended 34-pin Cable, 0.3 m	
MD0611C	V 36 Interface Test Unit	
	Standard accessory	
W0436AE	MD0611C Operation Manual	1 copy
	Optional accessories	
J0391	Double-ended 37 pin Cable, 2 m	
J0391B	Double ended 37 pin Cable, 0.3 m	
MD0611D	X 20/X 21 Interface Test Unit	
	Standard accessory	
W0437AE	MD0611D Operation Manual	1 copy
	Optional accessories	
J0393	Double ended 15 pin Cable, 2 m	
J0393B	Double-ended 15 pin Cable, 0.3 m	
MD0620A	GP-IB Remote-Control Unit	
	Standard accessory	
W0444AE	MD0620A Operation Manual	1 copy
	Optional accessory	
J0008	GP-IB Cable, 2 m	
MD0620B	RS-232C Remote-Control Unit	
	Standard accessory	
W0454AE	MD0620B Operation Manual	1 copy
	Optional accessory	
J0387	Double ended 25-pin Cable, 2 m	