DIGITAL SIGNAL PROCESSOR

DP-0206

DESCRIPTION

The TOA DP-0206 is a digital signal processor (DSP) that provides more than 20 different types of all-digital signal processing functions for audio system signals between the mixer output and the power amplifiers. The modular-design TOA DP-0206 can be configured for a wide range of system applications. This makes it possible to configure a system to match each individual installation, for an optimal number of functions. The standard 2 input/6-output I/O configuration can be expanded up to a maximum of 12 channels as needed including 2 in/8-out, 2-in/10-out, 4-in/6-out, 4-in/8-out, or 6-in/6-out configurations. One PC can control up to 30 DP-0206 units. Supplied software allows all configuration and parameter decisions to be input from a PC, for later recall from the processor's 16 on-board set-up memories. Memory settings can be called up by a PC, or directly on the unit. A module slot is available for remotely recalling preset memory settings by installing a DQ-C01 control module. The DQ-C01 module also enables remote-control output level changes.

System software has been designed for easy, intuitive set-up and operation, while also providing additional expert-level custom capabilities. Computer-driven configuration means that all possible signal flow choices are clearly displayed, while multiple security levels protect settings. Computer-to-processor connection is simple and data transfer is quick (max. 115,200 bps.). Signal flows can be easily set up with multiple processing functions, each having a large array of parameter controls. Built-in full matrixing allows independent routing of any combination of inputs to outputs, for zoning or room-combining applications. Flexible modular I/O features start with a basic 2-input/6-output configuration. Two audio module slots are available for inserting 2-channel DQ-A01 input or DQ-A02 output modules, adding up to 4 channels to either the input or output capacity, for smooth and efficient distribution via the matrix. Other signal processing capabilities include filtering, crossovers, parametric equalizing, compression, delay and noise gating.

TOA's CLEAR (Cross-Linked Exact A/D Resolution) Conversion Technology has been included on the DP-0206 to reduce noise and distortion, enhance the 110dB dynamic range, and ensure a clearer high-frequency signal. CLEAR circuitry also works together with the unit's separate low signal level A/D (analog to digital) path to create a more distinctive low frequency response. After the A/D noise is initially reduced, CLEAR conversion circuitry employs smoother crossovers to and from the processed and unprocessed A/D signal path, and an anticipatory hysteresis function that makes the changes happen exactly when needed, for a smoother signal flow.

FEATURES

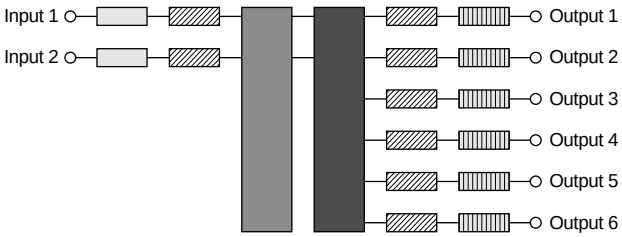
- Over 20 separate all-digital functions to process the signal path between mixer output and power amplifiers.
- Standard 2-input/6-output I/O configuration expandable via input or output modules to 2-in/8-out, 2-in/10-out, 4-in/6-out, 4-in/8-out, or 6-in/6-out.
- Built-in matrix with independent routing of any combination of inputs and outputs makes it easy to configure even complex signal flow patterns.
- Easy-to-use, intuitive software installed for inputting and editing configuration and parameter settings from desktop or laptop PC.
- New TOA patented CLEAR Conversion Technology ensures precise 24-bit analog-to-digital conversion and a dynamic range exceeding 110dB.
- Easy programming and real-time control of up to 30 units from a single PC, for effective support of both small and large installations.
- Wide range of audio processing tools to complement matrix, including crossovers, filters, compressor/limiters, noise gates, and delays.
- Multiple security levels restrict access to system settings.
- Effortless connections and high-speed PC to unit system settings, with automatic detection of PC com port and baud rate.
- Removable terminal blocks for fast, solderless connections.
- Sixteen on-board memories for storing and recall of system connections.
- Audio signal and peak indicators on each channel.
- Firmware upgrades via RS-232C or RS-485 downloads.
- Built-in rack mount brackets for standard 19" rack (2 RU).
- Optional TOA DQ-A01 (Analog 2-Input), DQ-A02 (Analog 2-Output) and DQ-C01 (Memory/Volume/Mute Remote Control) modules.

TOA

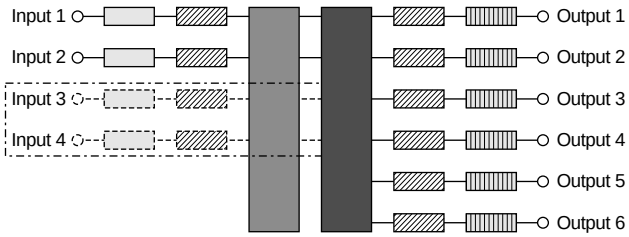
DP-0206

SIGNAL FLOW EXAMPLES

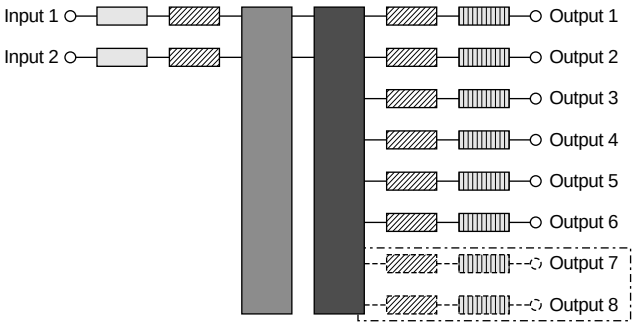
2 in 6 out



4 in 6 out



2 in 8 out



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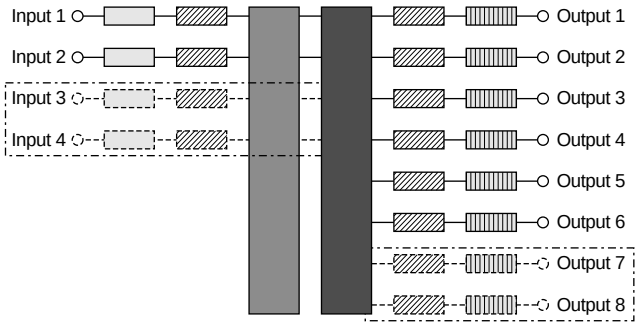
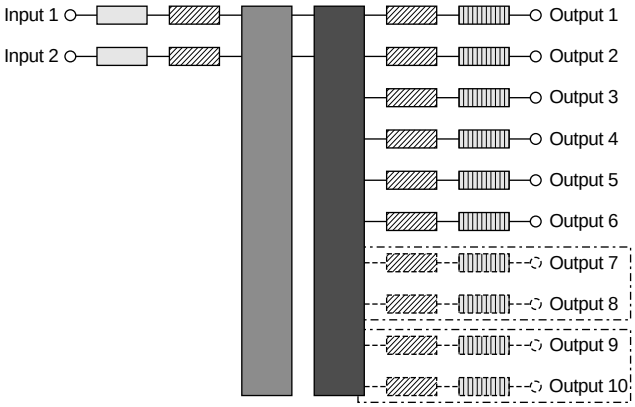
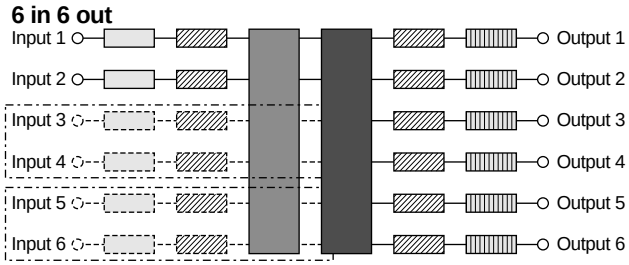
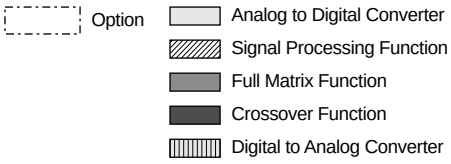


2 in 10 out



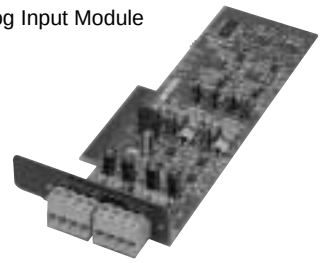
6 in 6 out

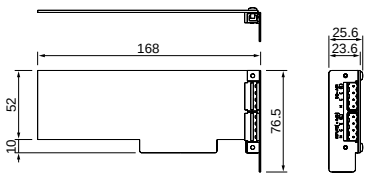




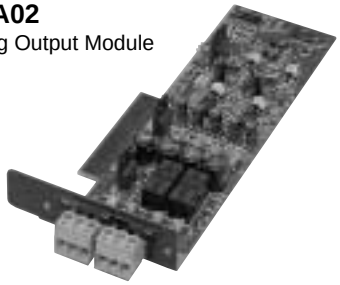
OPTIONAL MODULES

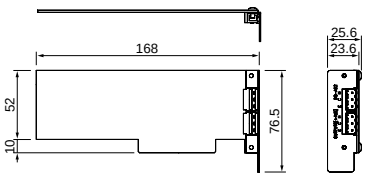
DQ-A01
Analog Input Module



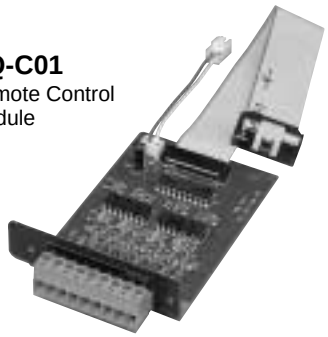


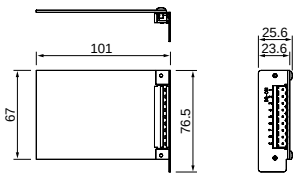
DQ-A02
Analog Output Module





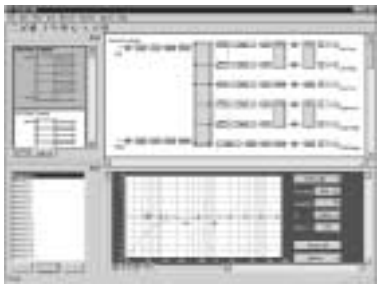
DQ-C01
Remote Control Module



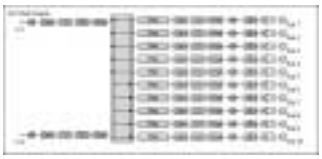


PROGRAMMABLE SIGNAL PROCESSING FUNCTIONS

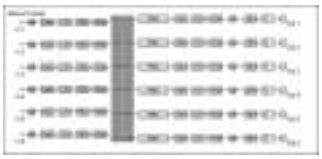
- +12 to –∞ Level Control
- 1/3 Octave Graphic Equalizer
- 10 Band Parametric Equalizer
- High Pass Filter
- Low Pass Filter
- Notch Filter
- Parametric Filter
- All Pass Filter
- High Frequency Shelving Boost
- High Frequency Shelving Cut
- Low Frequency Shelving Boost
- Low Frequency Shelving Cut
- High Frequency Horn Equalizer
- Compressor
- Noise Gate
- Signal Delay
- Polarity Inverse
- Full Input/Output Matrix with Level Control
- 2-way/3-way/4-way Channel Divider
- Mute



Main Window

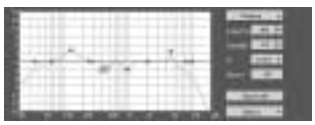


2 inputs/10 outputs Signal Flow

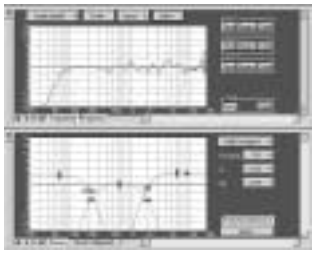


6 inputs/6 outputs Signal Flow

Input/output Gain



Parametric Equalizer



Crossover

Delay

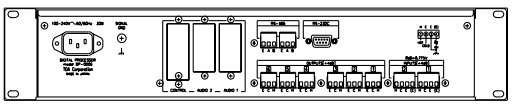
Compressor/Limiter/Noise Gate

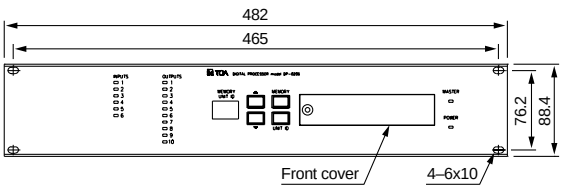
Compressor/Limiter/Noise Gate

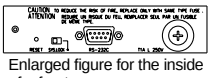
2 inputs/6 outputs Matrix

6 inputs/6 outputs Matrix

APPEARANCE AND DIMENSIONAL DIAGRAMS







Enlarged figure for the inside of a front cover

Unit: mm

PC CONTROL SOFTWARE FEATURES

1. Sets configurations and parameters of up to 30 units in real time.
2. Configurations and memory presets can be designed off-line in the office for later downloading.
3. Easy access to each processing function with graphic, simultaneous display of all parameter settings.
4. Display of amplitude response/phase response/group delay characteristic for each crossover settings.
5. Unlimited storage of signal-flow configurations and signal parameter processing setting of each device in data files on hard or floppy disks for archiving and downloading to the hardware units.
6. Printout capability included.
7. Firmware may be upgraded.
8. Multi level security function including password protection.
9. Measurement data input function allows crossover and equalization tuning of measured speaker system response files.
10. Flexible naming of memories, I/O and units.

SPECIFICATIONS

DP-0206 Hardware	
Power Source	AC Mains, 50/60 Hz
Power Consumption	30 W
Frequency Response	20–20,000 Hz, ±1 dB
Sampling Frequency	48 kHz
Dynamic Range	110 dB (IHF-A weighted)
Total Harmonic Distortion	Less than 0.05% at 1 kHz, +4 dB* (20–20,000 Hz, BPF)
Input	2 channels (expandable to up to 6 channels), +4 dB* (Max. +24 dB*), 10 kΩ, electronically-balanced, terminal block type connector (4 poles)
Output	6 channels (expandable to up to 10 channels), +4 dB* (Max. +24 dB*), connectable load: over 600 Ω, electronically-balanced, terminal block type connector (3 poles)
A/D Converter	24 bits
D/A Converter	24 bits
Signal Processing	
Level Control	+12 to –∞ dB, with polarity selector
Equalizer/Filter	Graphic equalizer: 1/3 octave band, 31 center frequencies (10 adjustable points) ±12 dB Q: 0.267–69.249, individually variable band Parametric equalizer: Continuously-variable frequency type (20–20,000 Hz), 10 points, ±12 dB Q: 0.267–69.249 Filtering: High-pass filter 20–20,000 Hz, 12 dB/oct, 6 dB/oct Low-pass filter 20–20,000 Hz, 12 dB/oct, 6 dB/oct Notch filter 20–20,000 Hz, Q/8.561–69.249 Parametric filter 20–20,000 Hz, ±12 dB, Q/0.267–69.249 All-pass filter 20–20,000 Hz, Q/0.267–69.249 High frequency boost or cut 6–20 kHz, ±12 dB Low frequency boost or cut 20–500 Hz, ±12 dB Horn equalizer 20 kHz, 0 to ±18 dB
Compressor	Threshold: –16 to +24 dB*, Ratio: 1 : 1 to ∞ : 1 Attack time: 0.02–100 ms, Release time: 10 ms – 5 s
Noise gate	Threshold: –∞ to –26 dB*, Attack time: 0.1 – 100 ms, Release time: 20 ms – 5 s
Delay	Delay time: 0–682 ms
Matrix	2 × 6 (Expanded I/O configuration: 2 × 8, 2 ×10, 4 × 6, 4 × 8 or 6 × 6) Level control: 0 to –∞ dB, with polarity inverter
Channel Divider	2-way, 3-way, 4-way Crossover frequency: Overlap mode, 20–20,000 Hz Slope: 6 dB/oct, 12 dB/oct, 18 dB/oct, 24 dB/oct Level: +12 to –∞ dB, with polarity selector Delay: 0–682 ms
Muting	Output muting

Memory	Pattern memory: 16 memories
Auxiliary Function	System Locking function
Control	Control software: PC software (Windows95/98/NT compatible)** Communications method: RS-232C, D-sub connector (9-pin) RS-485, terminal block type connector (3 poles), up to 30 units controllable Remote control module (option): Memory selection, output volume adjustment, and output muting can be remotely controlled from external equipment.
Panel Controls	Memory call-up key: 16 memories Unit ID indication key: 30 units Input level indicator: 6 channels, dual color LED Output level indicator: 10 channels, dual color LED Memory No./Unit ID indicator: Double-digit 7-segment LED Master indicator: Green LED
Finish	Panel: Aluminum, hair-line finish, black Others: Pre-coated steel plate, black, 30% glossy
Dimensions	482 (W) × 88.4 (H) × 325.2 (D) mm
Weight	4.65 kg
Accessory	Rack mounting screw × 4, Fuse × 1, Power cord × 1

DQ-A01 Analog Input Module	
Input	2 channels, +4 dB* (Max. +24 dB*), 10 kΩ, electronically-balanced, terminal block type connector (4 poles)
A/D Converter	24 bits
Sampling Frequency	48 kHz
Frequency Response	20–20,000 Hz (±1 dB)
Dynamic Range	110 dB (IHF-A weighted)
Total Harmonic Distortion	Less than 0.05% at 1 kHz, +4 dB* (20–20,000 Hz, BPF)
Finish	Pre-coated steel plate, black, 30% glossy
Dimensions	25.6 (W) × 76.5 (H) × 168 (D) mm
Weight	80 g
Accessory	Mounting screw × 2, Seal × 2, Terminal block type connector × 2

Software		
Matrix		Routing On/Off, Level Control, Polarity Invert/Normal
Character display		Up to 20 characters (alphanumeric)
Channel display		Up to 20 characters (alphanumeric)
Input	Gain	Gain, Polarity Invert/Nomal, Mute
	Compressor/Gate	Compressor-Threshold, Compressor-Ratio, Compressor-Synchronization, Compressor-Attack, Compressor-Release, Gate-Threshold, Gate-Attack, Gate-Release
	Parametric Equalizer	10 Bands Variable-Type [PEQ, HPF (–6, –12dB), LPF (–6, –12dB)], Bypass, Bypass All
	Graphic Equalizer	Frequency 1/3oct., Gain (+12dB to –12dB), Q [except HPF (–6dB)and LPF (–6dB)], Bypass, Bypass All
	Filter	2 Bands Variable-Type [Parametric, HPF (–6, –12dB), LPF (–6, –12dB), All pass, Low shelving, High shelving, Notch], Bypass, Bypass All
Output	Crossover	Single (Subwoofer), 2-way, 3-way, 4-way 2 Bands Variable-Type (–12 dB Bessel, –12 dB Butterworth, –12 dB Linkwitz-Riley, –12 dB Variable Q, –18 dB Bessele, –18 dB Butterwoth, –18dB Variable Q, –24 dB Bessele, –24 dB Butterwoth, –24 dB Linkwitz-Riley, Frequency, Gain, Time-Alignment, 24 dB variable Q
	Filter	12-Bands Variable-Type [Parametric, HPF (–6, –12dB), LPF (–6, –12dB), All pass, Low shelving, High shelving, Notch], Bypass, Bypass All
	Gain	Gain, Polarity Invert, Mute
	Compressor/Gate	Compressor-Threshold, Compressor-Ratio, Compressor-Syncronization, Compressor-Attack, Compressor-Release, Gate-Threshold, Gate-Attack, Gate-Release
	Delay	Time (0 – 682.63 msec)
	Attenuation	Attenuation, Mute
	Mute	Mute On/Off

DQ-C01 Control Module	
Control Input	COM and terminals 1–8: Open voltage: 5 V DC, short circuit current: 25 mA, terminal block type connector (9 poles)
Control	Memory selection: Direct: Max. 8 memories, Binary: 16 memories (Any one of 16 memories can be assigned to each terminal when set for "Direct" mode.) Control method: No-voltage make of over 500 ms/ No-voltage make pulse of over 500 ms (No-voltage make of over 500 ms only when set for "Binary" mode.) Volume control (Up/Down): Direct: Max. 4 groups, Binary: Max. 10 groups (Any output channel or channel group can be assigned to each terminal.) Control method: 1-step variation with no- voltage make pulse of over 500 ms. Continuous variation in 500 ms units with pulse of over 700 ms. Continuous up/down variation in 500 ms units with the addition of no-voltage make pulse of over 700 ms. Continuous volume variation stops when a break pulse is fed. Variable range: +12 to –∞ dB Muting (On/Off): Max. 8 groups (Any output channel or channel group can be assigned to each terminal.) Control method: No-voltage make of over 500 ms/ No-voltage make pulse of over 500 ms The above controls can be performed singly or in combination with other controls.
Setting	PC software (Windows95/98/NT compatible)*
Finish	Pre-coated steel plate, black, 30% glossy
Dimensions	25.6 (W) × 76.5 (H) × 101 (D) mm
Weight	60 g
Accessory	Mounting screw × 2, Terminal block type connector × 1

DQ-A02 Analog Output Module	
Output	2 channels, +4 dB* (Max. +24 dB*), connectable load: over 600 Ω, electronically-balanced, terminal block type connector (3 poles)
D/A Converter	24 bits
Sampling Frequency	48 kHz
Frequency Response	20–20,000 Hz (±1 dB)
Dynamic Range	110 dB (IHF-A weighted)
Total Harmonic Distortion	Less than 0.05% at 1 kHz, +4 dB* (20–20,000 Hz, BPF)
Finish	Pre-coated steel plate, black, 30% glossy
Dimensions	25.6 (W) × 76.5 (H) × 168 (D) mm
Weight	100 g
Accessory	Mounting screw × 2, Seal × 2, Terminal block type connector × 2

*0 dB = 0.775 V

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TOA Corporation

URL : www.toa.co.jp/global/

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