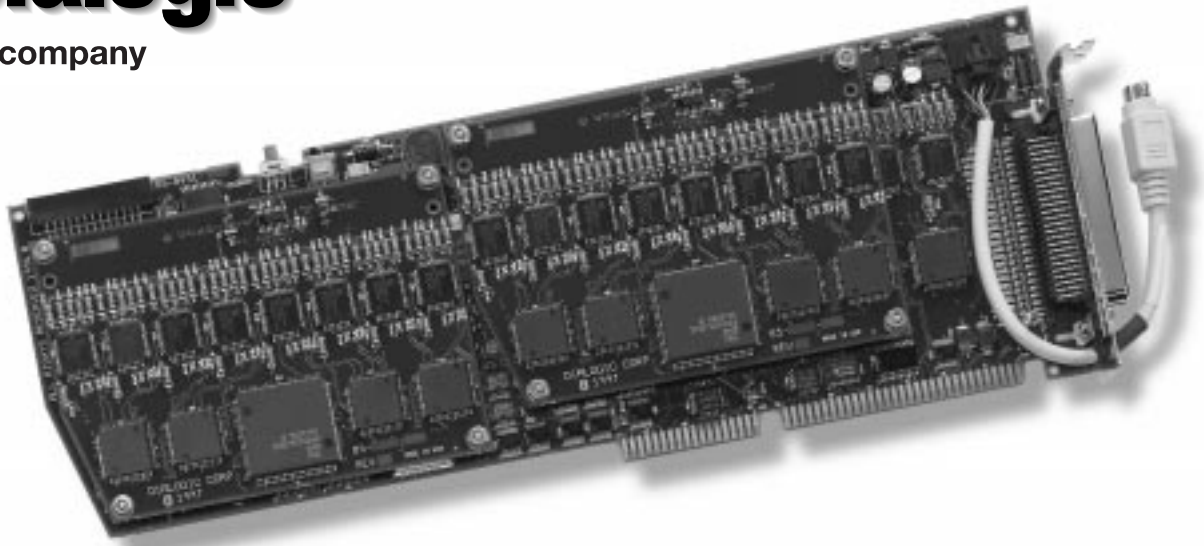# Dialogic®

an Intel company

| SCSA HARDWARE MODEL | AEB HARDWARE MODEL | PEB HARDWARE MODEL |

MSI-Global Series

Modular Station Interface Boards for the SCbus

Model	Channels	Interface	Form Factor	Resource Bus	OS Support	Ringing
MSI/80-GBL	8	RJ-21X,RJ-11*	PC AT ISA	SCbus	UNIX, Windows NT	Available
MSI/160-GBL	16	RJ-21X, RJ-11*	PC AT ISA	SCbus	UNIX, Windows NT	Available
MSI/240-GBL	24	RJ-21X, RJ-11*	PC AT ISA	SCbus	UNIX, Windows NT	Available

* With optional SA/240 Station Adapter and 50-pin cable

MSI-Global Series™ Modular Station Interface products incorporate a variety of analog devices, such as local 2500-type touchtone telephones, modems, and fax machines, into CT systems that are based on the open, industry-standard SCbus™ architecture.

With the MSI-Global Series, applications can be extended to incorporate live agent stations or third-party-add-on technology. Up to 24 analog station devices, such as local telephones, telesales agent headsets, modems, fax machines, or audio equipment can be connected to the SCbus. A conferencing feature enables applications to establish conferences between any of the time slots on the SCbus and the station devices connected to the MSI-Global board.

The MSI-Global Series consists of an MSI/80-GBL™ baseboard, which contains a digital signal processor (DSP) and eight station interface circuits. Up to two MSI/80-GBL daughterboard modules (each daughter board contains eight station interface circuits) can be added to the baseboard for a total of 24 ports. Preconfigured 16-port MSI/160-GBL™ and 24-port MSI/240-GBL™ models can also be ordered.

The MSI-Global board is an AT form factor board with a 16-bit bus that fits in a single AT (ISA) expansion slot (even with station daughterboards installed).

Each MSI-Global station interface connects an application-selectable time slot on the SCbus to an analog station device. The RJ-21X telephone interface on the MSI-Global board enables easy connections to breakout boxes or punchdown blocks. For standard RJ-11 jack connections, Dialogic offers an optional SA/240 Station Adapter and a 50-pin cable.

An external Dialogic MSI-Global Power Module provides loop current (battery) to local

FEATURES AND BENEFITS

- Connect up to 24 analog telephone devices directly to computer telephony (CT) systems and create affordable, low-end to mid-size, PC-based telemarketing systems and call centers

- Expandable, modular design lets you deploy just the right number of ports today and efficiently add more tomorrow — with configurations of 8, 16, and 24 station interfaces in a single ISA slot

- Build economical systems by sharing resources via the SCSA™ SCbus™. SCbus connectivity enables customized, integrated applications using a wide range of complementary technologies, like speech recognition, facsimile, and text-to-speech.

- Create more cost-effective switching solutions via access to the SCbus with its 1024 time slot capability and the capacity to build higher density systems and large, multinode systems through SCxbus™ communications

- Power ringing with automatic ring trip requires no additional external circuitry

FEATURES AND BENEFITS (cont.)

- Station status event detection allows collection of call traffic statistics via the application for cost-effective management of call setup and call termination

- Programmable channel gain provides channel volume control from the application and enables matching line levels from different devices

- Supports programmable notification tones for metering time expired

- Provides unobtrusive monitoring of connections

- Provides battery feed to power station sets

- Call conferencing supports up to 32 conferees in flexible configurations of two to eight parties per conference

- Conferencing resources include advanced features, such as broadcast, coaching, and dynamic additions and deletions without annoying training tones

- C language application program interfaces (APIs) for UNIX® and Windows NT® shorten your development cycle, so you can get your applications to market faster

- Programmable cadence allows you to select and set ring cadence options

- Downloadable front-end impedance — allows the MSI to connect to commercially available phones worldwide

- Jumperable dry audio input, ideal for playing music-on-hold

APPLICATIONS

- Inbound and outbound telemarketing

- Customer service, help desks

- Dictation/transcription

- Operator services, such as billing automation, directory assistance, and intercept treatments

- Automatic call distribution (ACD)

- Teleconferencing/conferencing bridge

- Audiotex

- Local information services

telephones through the MSI-Global. The system can handle multiple stations going on- or off-hook simultaneously.

All MSI-Global models are capable of providing a power ring that generates the AC voltage needed to ring standard 2500-type telephones. This power ring capability is contained completely onboard within the slot. No additional external circuitry is required. The MSI-Global defaults to a 33 percent duty cycle ring cadence and can ring 24 phones simultaneously.

Balanced lines ensure low noise and allow stations to be installed up to 5280 feet (1 mile) from the host PC. Built-in electrostatic discharge (ESD) protection lets agents insert and remove headset jacks, without damaging MSI-Global board circuits.

Application-programmable channel gain controls the volume for each channel and matches line levels from country-specific telephone sets and devices.

Station status event detection collects call traffic statistics and enables cost-effective management of call setup/call termination.

The MSI-Global board can be used to establish conferences between any of the time slots on the SCbus and the station devices connected to MSI-Global station modules. Call conferencing connects two to eight parties for up to 32 channels of total conferencing.

The following features are provided:
- two- to eight-party conferencing
- up to 32 conferencing resources, total
- conferences of any combination of agents and network channels
- hidden training for smooth entry of new conferees, without disruptive training noise
- supervisory monitoring of agents, without disrupting the conversation
- coaching feature that allows supervisors to speak to agents without the customer listening to the supervisor; customer can hear the agent at all times (no switching)
- programmable channel gain to optimize volume levels for station devices
- programmable cadence allows you to select and set ring cadence options (UNIX and Windows NT only)

Full digital conferencing capabilities allow a call center supervisor to participate in a transaction or to monitor a transaction in listen-only mode. The MSI-Global board's hidden training algorithms permit conferees to smoothly enter and exit a conference without hearing bothersome noises. By using the SCbus' broadcast capability, a virtually unlimited number of parties can monitor a conference.

Using the MSI-Global tone generation capabilities, an application can send alert tones to agents when an incoming call requires action.

The MSI-Global is fully compatible with all Dialogic and third-party products that use North-American μ-law or European A-law PCM (Pulse Code Modulation) coding schemes.

CONFIGURATIONS

Use the Dialogic MSI-Global to expand the capabilities of switching and station interface applications and to design economical cost-effective CT applications of any size. The MSI-Global board installs in IBM PC AT (ISA bus) and compatible computers (80386, 80486, or Pentium® processor-based PC platforms).

In a typical telemarketing application, a voice board or other resource board dials outbound numbers. When the system detects a called party going off-hook, the call is passed to a local operator through an available channel.

For inbound applications, calls that are not handled by voice automation can be passed directly to a live agent. The agent can be alerted to the incoming call by a power ring or zip tone.

Two MSI/160-GBL boards can be used to service all 30 channels of an E-1 network.

You can use the MSI-Global board as a conference resource, independent of the onboard station interfaces. For example, an MSI-Global board added to your CT system can provide conferencing to PBXs lacking that capability.

MSI-Global stations can be independently assigned to any SCbus time slot,

enabling station-connected agents or devices to serve as shared resources. Multiple MSI-Global boards can be installed in a single system, each sharing the same PC interrupt. For example, two MSI/240-GBL boards can be cabled to four D/240SC-T1™ voice and T-1 boards, via the SCbus, creating a 48-agent-by-96-trunk call center. Applications can exploit the switching ability of the SCbus to create economical agent-to-call ratios. The MSI-Global hardware permits up to 16 MSI/240-GBL boards in a single system. (System size limitations depend on the application and host processing power.)
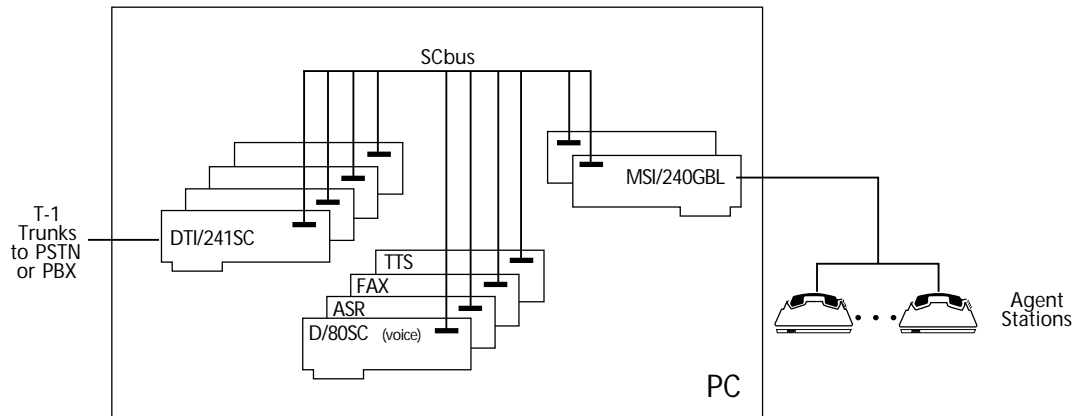

48 x 96 Call Center System

NOTE: The MSI-Global must not be connected directly to the public telephone network. Use only with local headsets and telephones.

SOFTWARE SUPPORT

The MSI-Global is supported by Dialogic System Software and Software Development Kits (SDKs) for UNIX and Windows NT. These packages contain a set of tools for developing complex multichannel applications.
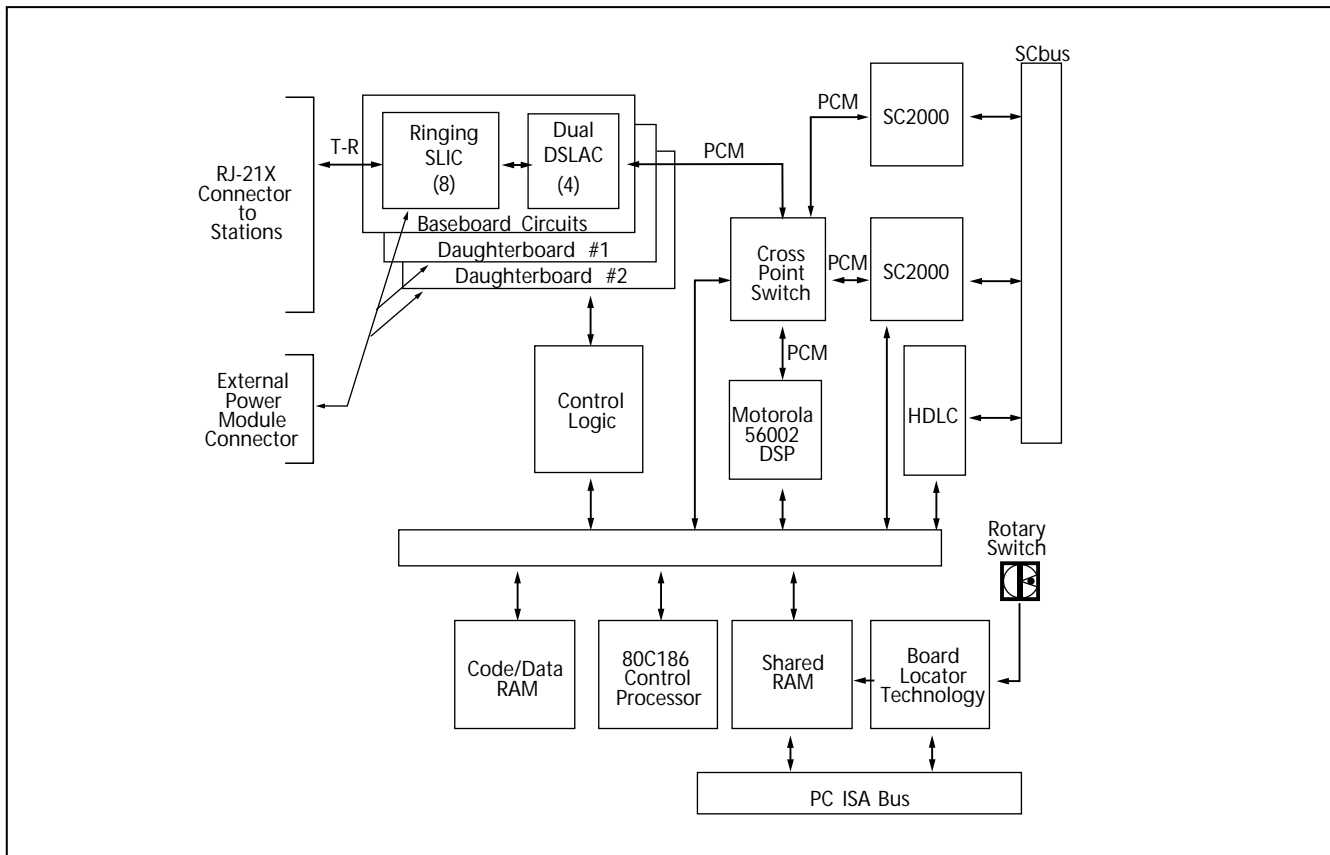
The signals from each station device (phone, headsets, etc.) enter the line circuitry on the MSI-Global board through an ESD filter, and are applied to a line interface on an MSI-Global baseboard or daughterboard. This filter protects the MSI-Global board against conditions, such as electromagnetic interference (EMI) and voltage transients on the station device lines — including electrostatic discharge and transients generated by plugging in or removing operator headsets.

Each MSI baseboard or daughterboard contains eight line interfaces and Dual Subscriber Line Audioprocessing Circuits (DSLACs) for COder/DEcoder (CODEC) functions. Each line interface provides loop start current to one station device. Loop start current to station devices (–24 VDC) can be turned on or off individually by the application. The line interface performs the 2 to 4 wire conversion which separates the inbound signal into an audio signal sent to the DSLAC. An on-hook/off-hook signal that is transmitted by the onboard control microprocessor via the input/output buffer is sent by the host PC AT bus to the application program.

The CODEC converts inbound audio from analog to eight-bit digital audio signals, and outbound audio from digital to analog signals. The gain of the CODEC is controlled separately for each station device through the application. The DSLAC then transmits the digital audio signals to the crosspoint switch conferencing circuit.

The crosspoint switch receives digitized audio signals from the DSLAC, and channel switching/connection signaling from the onboard control microprocessor for each channel. The crosspoint switch acts as the traffic coordinator to route PCM audio data from the local station interfaces to a DSP and the SCbus.

The crosspoint switch routes PCM data to and from the SCbus, any baseboard or daughterboard line interface, or DSP. A conference bridge feature of the MSI-Global board enables a user or an application to establish conferences (connect two or more parties) between any of the time slots present on the SCbus or station interfaces.

The control microprocessor interprets and executes commands from the host PC and controls all operations of the MSI-Global board via a local control bus. Communications between this microprocessor and the host PC are through the shared RAM interface to the PC ISA bus. All operations are interrupt-driven to meet the demands of real-time systems. All MSI-Global boards installed in the PC share the same interrupt line. When the system is initialized, firmware to control all board operations is downloaded from the host PC to the onboard RAM. This downloadable firmware gives the board all of its intelligence and enables easy feature enhancement.

The Board Locator Technology™ circuit operates in conjunction with a rotary switch to determine and set nonconflicting slot and IRQ interrupt-level parameters. This feature eliminates the need to set confusing jumpers or DIP switches. ∎

■ Technical Specifications*

Number of ports	8, 16, or 24
Max. boards/system	16
Resource sharing bus	SCbus
Control microprocessor	Intel 80C186 @ 16 MHz
Digital signal processor	Motorola DSP56002 @ 57 MHz, with 32 K word private, 0 wait state SRAM

HOST INTERFACE:

Bus compatibility	IEEE P996 ISA compatible (IBM PC XT/AT)
Bus speed	12.5 MHz maximum
Bus mode	Automatically configures to 8- or 16-bit transfer mode
Shared memory	8 Kbyte page
Base addresses	8000h to E800h, on 32 K boundaries. All MSI-Global boards share the same base address. Shared memory is page-mapped in/out dynamically as needed.
Interrupt level	IRQ 2/9, 3, 4, 5, 7, 10, 11, 12 are software selectable. All MSI-Global boards share one IRQ.
I/O ports	None

CONFERENCING:

Group sizes	2 to 8 ports
Maximum ports	32
Modes	Duplex, monitor, coach, pupil
Notification tones	Tones automatically generated when caller is added or deleted, periodically for tariff notification, or under application control
Programmable Tone Parameters	
Frequency	300 Hz to 3400 Hz, 31.25 Hz increments
Level	−10 dBm0 to −40 dBm0, 3 dB increments
Duration	10 ms to 4 sec, 10 ms increments
Interval between	2 sec to 17 minutes (Tariff Tone only)

TELEPHONE INTERFACE:

Connectors	RJ-21X female for connecting to SA/240 Station Adapter
Signaling type	Loop start originate
Telephone set connection	Two-wire loop start, balanced
Loop current	20 mA +3 mA
Signal level	−3 dB ±6 dB (telephone line, approx.)
Impedance	600 Ohms ±7%
2-wire return loss	25.0 dB + dB
Receive signal/noise ratio	36 dB +3 dB (−10 dBm, 1004 Hz)
Noise-to-ground	32 dBrnc +3 dB
Idle channel noise	15 dBrnc +3 dB
Channel-to-channel crosstalk	−70 dB max. (0 dBm, 1004 Hz)
Open loop voltage	−20 VDC +1.5 VDC (with −24 volt supply)
Closed loop current	−20 mA ±3 mA
Loop length	5280 feet (1 mile), typical (24 gauge)
Clock rate	Expansion: 2.048 Mb/s or 1.544 Mb/s Independent: 1.544 Mb/s
PCM algorithm	A-law or µ-law, software selectable
Ring voltage	54 Vrms @ 20 Hz
Ringer Equivalency Number (REN)	2 REN max. per station
Telephone ring frequency	20–25 Hz (ISA)

■ Technical Specifications* (cont.)

POWER REQUIREMENTS:

+5 VDC	2.5 A max.
+12 VDC	50 mA max.
−12 VDC	125 mA max.
External power	−70 VDC 300 mA
	−24VDC 1A
Operating temperature	0° C to $+50^o$ C
Storage temperature	$−20^o$ C to $+70^o$ C
Humidity	8% to 80% noncondensing
Form factor	PC AT, 13.34 in. long. 0.79 in. wide, 4.8 in. high

SAFETY and EMI CERTIFICATIONS:

United States	FCC Part 15 class A
	UL: E96804V
Warranty	3 years standard

*All specifications are subject to change without notice.

MSI-Global Power Module*

The MSI-Global Power Module generates −24 & −70 volts to power the MSI daughterboard station interface loop. One power module is required per MSI baseboard when station modules are used. The Power Module connects to a prewired power cable attached to the MSI-Global board.

Input connector	Standard North American AC input
Output connector	6-pin female mini-DIN
Internal fusing	Not user replaceable

POWER REQUIREMENTS:

Input voltage	
90 to 265 VAC	47 to 63 Hz
Output voltage	
−24 VDC	1.0A
−70 VDC	300 mA
Output ripple	<100 mV (peak-to-peak main)
Percent regulation	±2.5% for −24 V
	±7.5% for −70 V
Operating temperature	0° C to $+50^o$ C
Size	6.5 in. long, 3.75 in. wide, 2.17 in. high
Warranty	18 months standard

*All specifications are subject to change without notice.

SA/240 24-Port Telephone Station Adapter*

The SA/240 Station Adapter connects up to 24 local telephones (such as 2500-type telephone sets) or up to twelve AIA/2 Audio Interface Adapters (two-line external audio adapter), or some combination of these devices, to an MSI-Global board. The SA/240 adapter includes a cable assembly and an RJ-11 interface adapter unit. The cable has two RJ21X 50-pin standard USOC telephone connectors (the standard multiple line telecom interface) which connect to the MSI-Global board and to the adapter unit. The adapter unit converts the RJ-21X connectors into 24 standard RJ-11 connectors for easy connection to standard telephone sets. This adapter can be mounted to a convenient vertical surface.

ADAPTER UNIT:	
Telephone set connection	RJ-11 standard connectors
Number of RJ-11 connectors	24
Front panel connector	RJ-21X jack
CABLE:	
Length	4.5 ft (1.3 m), shielded
Connectors	RJ-21X, 50-pin male standard to MSI-Global board
	RJ-21X, 50-pin female standard USOC to adapter unit
Size	6.0 in. (15.4 cm) long, 3.8 in. (9.7 cm) wide, 1.25 in. (3.2 cm) high (excluding RJ-21X connector); 1.5 in. (3.8 cm) high (including RJ-21X connector)
Weight	24 oz.
Operating temperature	0° C to +50° C
Storage temperature	–20° C to +70° C
Humidity	8% to 80% noncondensing

SAFETY and EMI CERTIFICATIONS:	
United States	UL: 94V-O
Canada	CSA: Listed
Warranty	18 months standard

*All specifications are subject to change without notice.

OPTIONAL COMPONENTS

- MSI Power Module (99-2550-XXX) or user supplied –24/–70 VDC power supply (one per MSI-Global board)
- SA/240 Station Adapter Kit for MSI-Global (95-0004-XXX). Includes cable and breakout box. Use the following numbers to order separately:
  — RJ-21X Cable for MSI-Global (86-0083-XXX)
  — RJ-21X to RJ-11 Breakout Box (71-0004-001)