SIA Point Identification Multiplex Protocol - Security and Life Safety Applications - Addressable Detectors, Annunciators and Other Associated Devices

SIA PID-01-1995.12 (2000.06)

Sponsored by:

Security Industry Association

Publication Order Number: 14121

Point Identification Multiplex Protocol - Security and Life Safety Applications -
Addressable Detectors, Annunciators, and Other Associated Devices

FOREWORD

This standards document is published by the Security Industry Association (SIA) and was developed and adopted by a consensus of industry volunteers in accordance with SIA's standards development policies and procedures. It is intended to facilitate product compatibility and interchangeability, to reduce misunderstandings between manufacturers and purchasers, and to assist purchasers in obtaining the proper products to fulfill their particular needs.

The existence of this or any SIA standards document shall not prevent any SIA member or non-member from manufacturing, selling, or using products not conforming to this or any SIA standard. SIA standards are voluntary. SIA encourages the use of this document but will not take any action to ensure compliance with this or any other SIA Standard.

SIA assumes no responsibility for the use, application or misapplication of this document. Industry members using this document, particularly those having participated in its development and adoption, are considered by SIA to have waived any right they might otherwise have had to assert claims against SIA regarding the development process of this standard.

Although some SIA standards establish minimum performance requirements, they are intended neither to preclude additional product features or functions nor to act as a maximum performance limit. Any product the specifications of which meet the minimum requirements of a SIA standard shall be considered in compliance with that standard. Any product the specifications of which exceed the minimum requirements of a SIA standard shall also be considered in compliance with the standard, provided that such product specifications do not exceed any maximum requirements set by the standard. SIA standards are not intended to supersede any recommended procedures set by a manufacturer for its products.

SIA reserves the right to revise this document at any time. Because SIA policy requires that every standard be reviewed periodically and be either revised, reaffirmed, or withdrawn, users of this document are cautioned to obtain and use the most recent edition of this standard. Current information regarding the revision level or status of this or any other SIA standard may be obtained by contacting SIA.

Requests to modify this document are welcome at any time from any party, regardless of membership affiliation with SIA. Such requests, which must be in writing and sent to the address set forth below, must clearly identify the document and text subject to the proposed modification and should include a draft of proposed changes with supporting comments. Such requests will be considered in accordance with SIA's standards development policies and procedures.

Written requests for interpretations of a SIA standard will be considered in accordance with SIA's standards development policies and procedures. While it is the practice of SIA staff to process an interpretation request quickly, immediate responses may not be possible since it is often necessary for the appropriate standards subcommittee to review the request and develop an appropriate interpretation.

Requests to modify a standard, requests for interpretations of a standard, or any other comments are welcome and may be sent to:

Standards
Security Industry Association
635 Slaters Lane, Suite 110, Alexandria, VA, 22314
E-mail:
Standards@SIAOnline.org

This document is owned by the Security Industry Association and may not be reproduced, in whole or part, without the prior written permission from SIA.

ACKNOWLEDGMENTS

This standard was developed by the SIA Point Identification Standards Subcommittee. The Subcommittee voting members at the date the standard was approved are listed below.

SIA gratefully acknowledges the efforts of the many volunteers from the security industry that helped the Subcommittee to develop this standard.

Chair of the SIA Standards Committee:
Aritech Corporation ....David S. Terrett

Chair of the SIA Point Identification Standards Subcommittee:
Aritech Corporation ....David S. Terrett

Company Voting Members of the SIA Point Identification Standards Subcommittee:
ADT Security Systems..........................Samuel S. Wen, Bernard Worst

Aritech...Bruce W. Cardwell, David S. Terrett

Caddx-Caddi Controls, Inc.....................Frank Clark, Deborah Farren, Scott Furlong, Jim Stevens

Cascade Technology.............................Dave Schmidt

Detection Systems, Inc..........................Theodore A. Nesse

Interactive Technologies, Inc. ....Richard Buus

Radionics, Inc......................................Drew Chernoy, J. Michael Hambrick, Mark Hanna,
Joel Maslyn, Ray Nigro, Jeff Olinger, Kevin Patterson,
Geoffrey Peterson, Chris Warren

Sentrol, Inc...David Klauck, Doug Marman, Jim Paulson

System Sensor ....Gerry Connolly, Shelley DePuy, Paul J. Roach

SIA also recognizes the efforts of the SIA Point Identification Working Group who developed the *Recommended Self Validation Procedures* for the 2000 revision of this standard

Chair of the SIA Standards Committee:
ADT Security Systems..........................William Moody

Chair of the SIA Point Identification Standards Subcommittee:
Advanced Technology Associates..........David S. Terrett

Company Voting Members of the SIA Point Identification Standards Subcommittee:
ADT Security Services, Inc. ....Bernie Worst

Advanced Technology Associates ....David S. Terrett

Atlas Digital Detection, Inc. ....C. P. Sadler

CHPA Consulting Engineers ....Tim Tadlock

SIA Staff Administrators ....L. Virginia Williams
Guy Schroff

REVISION HISTORY

The following are changes made to this document, listed by revision.

DECEMBER 1995 BASELINE

Original Publication

JUNE 2000 REVISION

Added:

        Appendix   D: Recommended Validation Procedures

        Appendix   E: Combination Fire and Non-Fire Alarm Systems

THIS PAGE INTENTIONALLY BLANK

TABLE OF CONTENTS

THIS PAGE INTENTIONALLY BLANK

Point Identification Multiplex Protocol –
Security and Life Safety Applications -Addressable Detectors, Annunciators
and Other Associated Devices

COPYRIGHT © 1995-2000 SECURITY INDUSTRY ASSOCIATION

1. SCOPE

This standard defines the SIA protocol for addressable multiplex, sensor, control and annunciation modules for Security and Life Safety systems. This protocol utilizes two way digital transmission scheme, which can be implemented at low cost over a two wire trunk. The trunk also supplies power to the remote devices.

The protocol command set and response data allows highly reliable, error resistant transport of both analog and digital messages with fast response mode for any sensor or device in the alarm condition.

Devices may be interfaced to the trunk in any order in a single ended or loop configurations.

This protocol has been designed to work in life safety, security, and combination life safety and security systems. The protocol incorporates: an 8 bit address field, 16 different bus cycle codes, a priority alarm capability, expansion field, 256 different device types (each with 4 control and 4 status bits), an 8 bit analog data field, and extensive error detection through address echoing, double polling and a Cyclic Redundancy Check (CRC).

The analog addressable protocol allows sensors (remote units) to be connected to a 12 or 24 Volt two-wire multiplexed trunk that carries both power and data between the control panel and the remote units. This trunk may be configured as a class A (fault tolerant ring) or class B. Spurs or "T" taps are allowed. Sensor addresses can be in any order. Average normal power consumption in this two wire configuration should be less than 1 mA per sensor and the maximum normal trunk current should be less than 100mA otherwise the total reach of the systems may be severely limited by the ohmic drop of the cable.

A two-way communication link is established by voltage Pulse Code Modulation (PCM) from the control unit and synchronous current pulsing from the remote units. The communications between the panel and remote units is set up as a master/slave link which consists of the panel polling a particular address or group of addresses followed by the synchronous response of the addressed unit. All actions of the remote units are controlled by the control panel. This allows the control panel to continually monitor the presence and functionality of all attached units, and to modify the alarm processing algorithms as needed per location. The address of each remote unit is an 8 bit value that is programmable. Each device responds to the control unit by executing commands, sending digitized sensor readings, and confirming local addresses. The sensor readings sent back to the control unit are the present analog output of the sensor in a digitized format. Or in the case of a non-analog device, is an eight bit value indicating the present sensor status. Data transfers between the control unit and the remote unit are validated through the use of a 4 bit CRC, and an address echo data field. All commands to the remote unit will be further validated through the use of double polling. Since the remote units recognize their own address, interrogation of the units can be done in any order.

2. CONVENTIONS

2.1 Use Of Italics

Some portions of this document are advisory in nature and are not part of the mandatory requirements of the standard. To clearly indicate which portions of the document are advisory, the text of advisory portions are in italics *(italic)*. Non-italicized text within the document shall be considered mandatory requirements of the standard.

2.2 Units Of Measurement.

In accordance with SIA Policy, the units of measurements used throughout publication are the units of the System International d' Unites (SI), commonly known as metric units. Equivalent English Units, enclosed in parenthesis, are also used in this publication. These equivalent English Units are approximate conversions and are provided for easy reference.