

Technical Reference

“WIEGAND” TUTORIAL -- INTRODUCTION

Between the card reader and the controller in an access control system, there must be an interface for the credentials' individual code data. This is usually the “Wiegand” interface.

a. Introduction

This section of memos describes the origin of the term “Wiegand” and its uses for access control in the Security industry. Important technical details that distinguish Wiegand data transmission are included.

b. The Name “Wiegand”

This memo explains the three ways that the name "Wiegand" is used in the industry. This surely creates confusion. If someone asks about "Wiegand", we need to establish if the question refers to the *code format*, or the *electrical interface*, or the card *encoding technology* -- three different subjects. (The third use is rarely heard now.)

c. Interface Specifications and Pulse Timing

This shows the timing of the output data pulses. Pulse amplitude is at TTL levels. Binary data pulses are negative-going (toward zero) from standby +5 volts DC. There are two data lines – a line for “zero” binary bits, and a line for “one” binary bits. There is always either a 0 data bit or a 1 data bit for each numbered bit position in the two data strings. But there is never *both* a 0 bit *and* a 1 bit in the same time slot. Pulses are asynchronous; there is no clock line.

d. Installation Sheet for Wiegand Interface

The Installation Sheet or Quick Installation Guide for any AWID card reader gives the details for connections to the host system using the Wiegand interface. The common characteristic in this hook-up is having separate wires for Data-0 pulses (on the reader's green wire) and for Data-1 pulses (on the white wire).

There is always a third wire for Data-Common, which provides the return path for the Wiegand data circuits from the controller back to the reader. In low-frequency (proximity) readers, Data-Common is combined with DC power negative (on the black wire), for connection usually to the Ground terminal on the controller's reader port. But in AWID's UHF long-range readers, Data-Common is assigned to a different wire (blue), separate from DC power negative.

e. Bit-Map for 26-bit-STD Format

This chart shows the bit layout for the most popular of the Wiegand code formats -- the worldwide "industry-standard". The chart contains the two data fields (site code or facility code, and card identification number or PIN), and the two parity bits for error checking. A “Wiegand” style format always contains these elements, sometimes with variations. Virtually every supplier of products for access control shares the standard 26-bit format shown in this bit-map.

There is no “official” published standard for the Wiegand electrical interface. It was proprietary with Sensor Engineering Company (later merged into HID) until about 1988, when Sensor voluntarily opened the protocol to all companies in the industry through a committee of the Security Industry Association (SIA). It is an ad hoc standard that is used by probably 100% of the systems manufacturers in the industry.

AWID's Technical Support people will talk with customers and prospects about characteristics of data interface – both Wiegand interface, and the alternative RS-232 data communications standard in non-access-control applications.