

**Susquehanna Area Regional Airport Authority
Harrisburg International Airport
Harrisburg, Pennsylvania**

Overview of Airport Baggage Handling System

This Airport Baggage Handling System is an in-line system with the majority of components located in the basement of the new terminal building at the Harrisburg International Airport. The system essentially consists of three sections:

1. EDS Screening Area - fed by the ticket counters and the manual input conveyor
2. Baggage Sortation Area - fed by the cleared bags from the EDS screening area
3. BHSO designed for oversized bags

The Explosive Detection System (EDS) screening system is fed by (5) Ticket Counter Input conveyors and one (1) Manual Input conveyor (transfer bags). All ticket counter baggage and the manual input conveyor baggage feed onto a main collector line which transports the baggage to a 100% In-Line baggage screening system or to an EDS Oversize (EDSO) screening line. The cleared bags are routed to the baggage sortation area where they are sorted to one of five (5) make-up devices. The five (5) make-up devices are comprised of four (4) flat plates and one (1) slope plate. The in-line screening system was originally configured with three EDS machines, but the number of EDS machines was reduced to two machines during a TSA funded EDS Recapitalization project accomplished in 2015.

Oversized bags are manually carried and checked at the BHSO conveyor located to the East of the ticket counter positions. The oversized bags on the BHSO conveyor are transported behind the ATO space to a manual screening area. After the bags are screened, they are then placed onto a take away conveyor where they are transported and delivered to an oversized roller top conveyor for carrier pickup.

The control system for the Baggage Handling System is a decentralized Programmable Logic Controllers (PLC) design, with centralized or remote I/O, and a centralized Baggage Handling System computer. The control system is based on multiple PLCs interconnected to each other by data communication highways (parallel redundancy with the power supply), and with connections to the host computers. Local Area Networks (LAN) are employed to provide data messaging between the baggage handling system computers and the host computers.

This BHS control system is based on Ethernet networks for communication between systems and on ControlNet and DeviceNet for machine level I/O communications. Serial communication is also used for the interfaces to certain equipment, such as between MVI Modules and automated ticket readers (ATRs) and between MVI Modules and EDS machines. The general architecture of the system is described as follows.

The communications network between PLCs is ControlNet. The network is commonly referred to as the Peer-to-Peer network. This ControlNet network is used to connect all PLCs, as well

as the communication bridges. It should be noted that the motor control panels (MCPs) only house the I/O and communication cards. All processors are located in a logic control panel (LCP). The LCP is located in the MCP room adjacent to the control room. The communications with the majority of the control devices, control stations, photo-eyes and VFD controls is accomplished via DeviceNet. The networks contain multiple device types and are limited to a particular geographic area. The number of networks is determined by the amount of control devices in the area. Devices that require immediate update in the PLC, such as shaft encoders, are wired directly to a rack to minimize communication delays. Ethernet based local area networks provide communications between the baggage handling computer system and the host computers of the Man Machine Interface (HMI) head-end. There are currently nine devices within the BHS that communicate via ethernet. These include three ATRs, five Panel View units, and the Baggage Measuring Array.

The intent of the next project is to convert the ControlNet and DeviceNet for machine level I/O communications over to an Ethernet based system.