DXI SAC Software: External Protocol Support

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1. Intent & Scope

The Application Note describes the available protocols for external devices on a DXI system.

2. Introduction

The DXI system SAC software includes support for third party devices, such as CCTV systems and text generators (for CCTV and video visitation control), host ports (for PLC or PC control of the DXI system), or annunciator panels.

This document describes the supported protocols.

3. Overview

The following table shows the supported protocols at a glance.

For further information on each protocol, see the appropriate section following.

Table 1: Host Control Protocols

Protocol	DXI Card Type	Notes
Serial Port	DXI_HOST	Text RS-232 Serial port host
TCP/IP	TCPIP_HOST	Text TCP/IP Ethernet host
Modbus TCP/IP	MODBUS_TCPIP	Modbus TCP/IP Ethernet host
Omron UDP/IP	OMRON	Omron UDP/IP Ethernet host
Allen Bradley TCP/IP	FIELDBUS_HOST	Allen-Bradley PLC-5/SLC-5 Ethernet host
Custom Modbus TCP/IP	MODBUS_TCPIP_PEER	Custom Modbus TCP/IP Ethernet host
Dynatrol	MARCOMM_TOUCHSCREEN	Dynatrol UDP/IP host
Modbus Plus	MODBUS_HOST	Modbus Plus host (requires Modbus Plus card)
Harding HI4K	HDLC_HOST	Harding HI4K Serial port host (Obsolete)
DXI Touchscreen	DXI_TOUCHSCREEN	Harding DXI Touchscreen host (Obsolete)
Dummy Host	DUMMY_CARD	Harding internal use only (Obsolete)

Table 2: CCTV Protocols

Protocol	DXI Card Type	Notes
Pelco ASCII	PELCO_DT9760_CTRL	Pelco switchers using Pelco ASCII protocol
Ultrak Maxpro	MAXPRO	Maxpro switcher (includes video visitation support)
Burst VS8x8	BURST_VS8X8	VS8x8 switcher (includes video visitation support)
Allegiant	ALLEGIANT	Bosch / Buerle / PhillipsCSI Allegiant switcher (includes video visitation support)
Vicon	VICON	Vicon switcher
Panasonic	PANASONIC	Panasonic switcher compatible with SX850
American Dynamics AN001	AMERDYN_AN001	American Dynamics switcher
American Dynamics	AMERICAN_DYNAMICS	American Dynamics switcher (Obsolete)
Pelco 9750	PELCO_9750_CTRL	Pelco 9750 using RS-485 keyboard port (Obsolete)

Table 3: Alarm I/O Protocols

Protocol	DXI Card Type	Notes
Mobile Intrusion Monitor System	MIMS	Generates alarm inputs to DXI
Starcomm Fire Alarm Annunciator System	STARCOMM_HOST	Accepts alarm outputs from DXI
Simplex	SIMPLEX	Generates call connects to DXI Accepts alarm outputs from DXI

Table 4: Other Protocols

Protocol	DXI Card Type	Notes
GYYR Video Mux	GYYR_DS16C_MUX	GYYR DS16C Video Mux (Sets date only)

Table 5: Unused Protocols

DXI Card Type
ISO_1745
STARCOMM
CREATIVE_HOST

Note: These are card types defined in the DXI system, but do not do anything, as they are not implemented.

4. Host Control Protocols

Host control protocols allow an external device (usually a PC running HMI software, or a PLC) to control the DXI system. The communications interface is usually either an RS-232 serial port or Ethernet, although other specialized hardware can be used.

All of the TCP/IP and UDP/IP Ethernet hosts require the QNX TCP/IP software to be ordered with the SAC computer.

4.1 Serial Port Host

This host allows controlling the DXI system using an RS-232 serial port.

This is recommended for a general-purpose serial interface to the DXI system.

Serial Port Host Documentation

Document ID	Document Name	Notes
IM-PROT-SERIAL	DXI host communication protocol	Serial communications protocol
IM-MES-DXI	Host port command/status messages	Command/Status messages

4.2 TCP/IP Host

This host allows controlling the DXI system using TCP/IP over Ethernet.

This is recommended for a general purpose Ethernet TCP/IP interface to the DXI system.

TCP/IP Host Documentation

Document ID	Document Name	Notes
IM-PROT-TCPIP	TCP/IP Host Protocol	TCP/IP communications protocol
IM-MES-DXI	Host port command/status messages	Command/Status messages
APP-101	TCP/IP Host Protocol Example Design	Example design for redundant operation

4.3 Modbus TCP/IP Host

This host allows controlling the DXI system using the Modbus TCP/IP protocol over Ethernet.

This protocol is recommended for a general purpose PLC Ethernet interface to the DXI system.

This is compatible with most PLC's including GE Fanuc and Modicon PLC's, and most HMI packages including Wonderware and Cimplicity/HMI.

Modbus TCP/IP Host Documentation

Document ID	Document Name	Notes
IM-PROT-MODTCP	Modbus TCP/IP Host Protocol	Modbus TCP/IP communications protocol
IM-MES-DXI	Host port command/status messages	Command/Status messages

4.4 Omron UDP/IP Host

This host allows controlling the DXI system using the Omron UDP/IP FINS protocol over Ethernet.

This is compatible with Omron CV-series PLC's.

Omron UDP/IP Host Documentation

Document ID	Document Name	Notes
IM-PROT-OMRON	Omron Host Protocol	Omron UDP/IP communications protocol
IM-MES-DXI	Host port command/status messages	Command/Status messages

4.5 Allen Bradley TCP/IP Host

This host allows controlling the DXI system using Allen Bradley PLC's over Ethernet.

This protocol requires additional software purchased from Harding Instruments.

This protocol is compatible with Allen-Bradley PLC5 and SLC5 series of PLC's.
It is not compatible with Allen-Bradley ControlLogix PLC's.

This protocol is not recommended for new systems.

Modbus TCP/IP Host Documentation

Document ID	Document Name	Notes
IM-PROT-FIELD	FieldBus Host Protocol	Allen Bradley TCP/IP communications protocol
IM-MES-DXI	Host port command/status messages	Command/Status messages

4.6 Custom Modbus TCP/IP Host

This host is a simple interface for controlling limited DXI systems using Modbus TCP/IP protocol.

This protocol has been used with Cimplicity/HMI software.

This protocol is not recommended for new systems, as it has limited functionality, and a limited number of stations that can be controlled.

Custom Modbus TCP/IP Host Documentation

Document ID	Document Name	Notes
IM-MES-MODTCPIP	Modbus TCP/IP Touch Screen Host Interface	Custom Modbus TCP/IP Documentation

4.7 Dynatrol Host

This host is for controlling DXI systems with QNX Dynatrol software running on the same computer as the SAC software.

This protocol is for use only with Dynatrol software.

Dynatrol Host Documentation

Document ID	Document Name	Notes
IM-PROT-DYN	Dynatrol Host Protocol	Dynatrol communications protocol
IM-MES-DXI	Host port command/status messages	Command/Status messages

4.8 Modbus Plus Host

This host allows controlling the DXI system using Modbus over a Modbus Plus network.

This protocol is compatible with Modicon and Allen Bradley PLC's.

This requires additional hardware and software purchased from Harding Instruments.

This is not recommended for new systems.

Modbus Plus Host Documentation

Document ID	Document Name	Notes
IM-PROT-MODP	Modbus TCP/IP Touch Screen Host Interface	Modbus Plus communications protocol
IM-MES-DXI	Host port command/status messages	Command/Status messages

5. CCTV Protocols

CCTV protocols allow the DXI system to control an external CCTV switcher. The communications interface is usually an RS-232 serial port.

Some CCTV switchers have advanced features that may be utilized by DXI systems.

Time/Date: The CCTV switchers indicated can have their time and date set by the DXI system. This allows synchronization of the DXI time and the time displayed on the switcher.

Presets: The DXI system can send preset information (Pan/Tilt/Zoom settings) to the indicated switchers.

Video Visitation: The DXI system can utilize this switcher in a video visitation system. The switcher has text display capabilities that will be used for informational messages displaying visitation status and visitation time remaining.

Alarm point capability: The DXI system can send alarm point outputs to these CCTV switchers. This can be an alternate method to activate camera->monitor combinations.

Table 6: CCTV Protocols

Protocol	Time & Date	Presets	Video Visit	Alarm Points	Notes
Pelco ASCII	√	√		√*	Alarm points only supported on some models
Ultrak Maxpro			√	√	
Burst VS8x8			√		
Allegiant	√	√	√	√	
Vicon	√	√	√		Can control auto-step
Panasonic	√	√	√	√	
American Dynamics AN001					
American Dynamics					(Obsolete)
Pelco 9750	√	√		√	Uses RS-485 keyboard port (Obsolete)

5.1 Pelco ASCII

This CCTV protocol controls a Pelco CCTV switcher using the Pelco ASCII protocol.

It supports both direct connect and alarm point CCTV switching, and allows pan/tilt/zoom presets.

Compatible switchers include:
Pelco CM6700 (Note: does not support alarm point CCTV switching)
Pelco CM6800 (Note: does not support alarm point CCTV switching)
Pelco CM6800E
Pelco CM9740 with CM9760-DT4 Data Translator
Pelco CM9760 with CM9760-DT Data Translator
Genetec Omnicast with Smartsight encoder in Pelco ASCII compatibility mode

Pelco ASCII CCTV Switcher Documentation

Document ID	Document Name	Notes
APP-100	DXI SAC Software: Configuring a CCTV Switcher	CCTV Configuration Application Note

5.2 Ultrak Maxpro

This CCTV protocol controls an Ultrak Maxpro CCTV switcher.

It supports both direct connect and alarm point CCTV switching, and allows text generation for video visitation.

Compatible switchers include:
Ultrak MAX1000

Ultrak Maxpro CCTV Switcher Documentation

Document ID	Document Name	Notes
APP-100	DXI SAC Software: Configuring a CCTV Switcher	CCTV Configuration Application Note

5.3 Burst VS8x8

This CCTV protocol controls a Burst VX8x8 CCTV switcher.

It supports direct connect CCTV switching, and allows text generation for video visitation.

Burst VS8x8 CCTV Switcher Documentation

Document ID	Document Name	Notes
APP-100	DXI SAC Software: Configuring a CCTV Switcher	CCTV Configuration Application Note

5.4 Allegiant

This CCTV protocol controls a Bosch / Burle/ PhilipsCSI Allegiant CCTV switcher.

It supports both direct connect CCTV switching, allows pan/tilt/zoom presets, allows text generation for video visitation, and supports alarm point outputs.

Compatible switchers include:
LTC8100, LTC8200, LTC8300, LTC8500, LTC8600, LTC8800, LTC8900

Allegiant CCTV Switcher Documentation

Document ID	Document Name	Notes
APP-100	DXI SAC Software: Configuring a CCTV Switcher	CCTV Configuration Application Note

5.5 Vicon

This CCTV protocol controls a Vicon CCTV switcher.

It supports both direct connect CCTV switching, allows pan/tilt/zoom presets, and allows text generation for video visitation.

Compatible switchers include Nova V1466 and V1500 and equivalent switchers.

Vicon CCTV Switcher Documentation

Document ID	Document Name	Notes
APP-100	DXI SAC Software: Configuring a CCTV Switcher	CCTV Configuration Application Note

5.6 Panasonic

This CCTV protocol controls a Panasonic CCTV switcher.

It supports both direct connect CCTV switching, allows pan/tilt/zoom presets, allows text generation for video visitation, and supports alarm point outputs.

Compatible switchers include:
Panasonic WJ-SX850

Panasonic CCTV Switcher Documentation

Document ID	Document Name	Notes
APP-100	DXI SAC Software: Configuring a CCTV Switcher	CCTV Configuration Application Note

5.7 American Dynamics AN001

This CCTV protocol controls an American Dynamics CCTV switcher using the protocol outlined in American Dynamics application note AN001.

It supports direct connect CCTV switching.

Compatible switchers include:
American Dynamics AD1024, AD2150, AD1650B MicroPower EP, MegaPower II, MegaPower 48+

American Dynamics AN001 CCTV Documentation

Document ID	Document Name	Notes
APP-100	DXI SAC Software: Configuring a CCTV Switcher	CCTV Configuration Application Note

5.8 American Dynamics

This CCTV protocol controls an American Dynamics CCTV switcher.

It supports direct connect CCTV switching.

This protocol is not recommended for new systems. This protocol is identical to the American Dynamics AN001 protocol except it adds extra control characters before and after the CCTV messages. For American Dynamics switchers, try the American Dynamics AN001 protocol first, and revert to this protocol if that does not work.

American Dynamics CCTV Documentation

Document ID	Document Name	Notes

APP-100	DXI SAC Software: Configuring a CCTV Switcher	CCTV Configuration Application Note

5.9 Pelco 9750

This CCTV protocol controls a Pelco 9750 CCTV switcher.

It supports both direct connect and alarm point CCTV switching.
With this protocol, the SAC must be connected through an RS-485 converter to a keyboard port on the Pelco.

This protocol is not recommended for new systems.

Compatible switchers include:
Pelco CM9750 with RS-485 converter

Pelco 9750 CCTV Documentation

Document ID	Document Name	Notes
APP-100	DXI SAC Software: Configuring a CCTV Switcher	CCTV Configuration Application Note

6. Alarm I/O Protocols

Alarm I/O protocols allow the DXI to receive alarm inputs from or send alarm outputs to an external device, such as an annunciator panel. The communications interface is usually an RS-232 serial port.

6.1 Mobile Intrusion Monitor System

This protocol allows the MIMS device to generate alarm inputs to the DXI system.

6.2 Starcomm Fire Alarm Annunciator System

This protocol allows the DXI system to generate alarm outputs to the Starcomm Fire Alarm Annunciator System

6.3 Simplex

This protocol allows the DXI system to generate alarm outputs to the Simplex fire alarm system. It also allows the Simplex system to send serial port host communications commands to the DXI system.

7. Other Protocols

7.1 GYYR Video Mux

This protocol only sends the date and time from the DXI system to the GYYR Video Mux whenever the SAC changes its date and time.