Sure Coat® Modular Gun Control System

# Part C:
# UCS DeviceNet Interface Card

Customer Product Manual
Part 334661C
Issued 4/03

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# *Section C 1*
# Description

## Introduction

The UCS DeviceNet interface card uses the DeviceNet communication protocol for open serial communication between a PLC and the modular gun control system.

The UCS DeviceNet interface card is installed in slot 9 of the main control cabinet's card cage.

The UCS DeviceNet interface card allows the PLC to automate the operation of the modular gun control system and perform the following functions through the application controller:

- Purge guns
- Trigger guns individually
- Set guns to F1/F2 settings on an individual basis
- Adjust set points to guns on an individual basis
- Change Select Charge modes
- View faults on the application controller
- View status information on the UCS DeviceNet interface card

## I/O Signals

The UCS DeviceNet interface card uses a standard 5-pin DeviceNet interface to communicate with the application controller/PLC and gun purge module.

### *Inputs*

See Figure C 1-1 and refer to Table C 1-1. There are five inputs on the network interface terminal block (8). The inputs allow the UCS DeviceNet interface card to communicate with a standard DeviceNet master system.

Table C 1-1 Input Terminal Functions

| Terminal | Function |
|---|---|
| BLK | 24 V common |
| BLU | CANL (communications low) |
| GRY | Cable shield drain wire |
| WHT | CANH (communications high) |
| RED | 24 V positive |

### *Outputs*

See Figure C 1-1 and refer to Table C 1-2. There are two outputs on the purge terminal blocks (5) that allow the card to be connected to the optional gun purge module.

Table C 1-2 Output Terminal Functions

| Terminal | Function | Terminal | Function |
|---|---|---|---|
| 1 | Not used | 7 | Not used |
| 2 | Not used | 8 | Not used |
| 3 | Not used | 9 | Not used |
| 4 | Not used | 10 | Not used |
| 5 | Gun purge solenoid (positive) | 11 | Not used |
| 6 | Gun purge solenoid (negative) | 12 | Not used |

## Theory of Operation

### *Purging*

The card's purge outputs are wired to the purge panel solenoid. The application controller/PLC commands the UCS DeviceNet interface card to send a signal to the purge panel solenoid. The solenoid opens, sending a pneumatic signal to activate the gun purge module.

The gun purge output is activated by pressing the GUN PURGE key on the central control unit. The gun purge function remains active for as long as the operator presses the GUN PURGE key.

### *F1/F2*

**NOTE:** The F1/F2 function is only available for systems that have three-gauge, F1/F2 pneumatic modules.

The UCS DeviceNet interface card allows the application controller/PLC to switch the guns between two flow rate air settings. The application controller/PLC switches F1/F2 air pressure settings on either an individual gun or all guns at the same time.

**NOTE:** The flow rate air settings must be adjusted on each individual gun's pneumatic module.

# Switches

See Figure C 1-1 and refer to Table C 1-3. The UCS DeviceNet interface card has two button switches and one dip switch assembly.

Table C 1-3 Switches

| Item | Switch | Function |
|---|---|---|
| 1 | Service | Informs the system that new software is installed |
| 2 | Reset | Resets the interface card's microprocessor |
| 10 | SW3 | 8-position dip switch assembly to program card address<br>  |

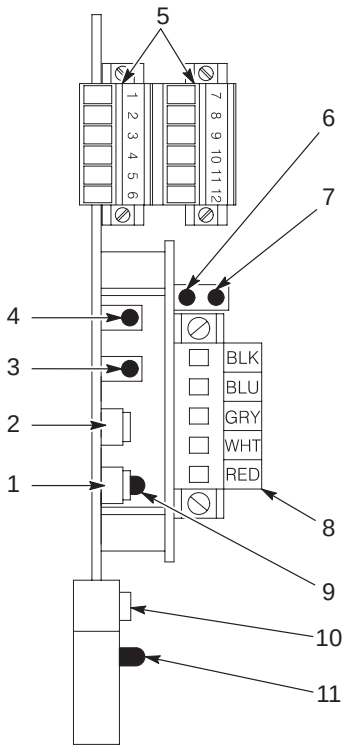


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Figure C 1-1 UCS DeviceNet Interface Card Components

1. Service switch
2. Reset switch
3. Status LED
4. Fault LED
5. Output (purge) terminal block
6. Network status LED
7. UCS status LED
8. Input (network interface) terminal block
9. Service LED
10. SW3 (dip switch assembly)
11. Power LED

# LEDs

See Figure C 1-1 and refer to Table C 1-4. The six LEDs on the UCS DeviceNet interface card indicate system status.

Table C 1-4 LED Identification

| Item | Color | Function | Status | Meaning |
|---|---|---|---|---|
| 3 | Green | Status | Flashing green | Communicating properly with a gun card |
| 4 | Red | Fault | Red continuously | No communication with the application controller or PLC |
| 6 | Green/Red | Network Status | Off | Network interface offline/No network power |
| | | | Flashing red | I/O connection in timed out or other recoverable fault |
| | | | Flashing green | Device is online, but has no connection |
| | | | Red continuously | Unrecoverable fault |
| | | | Green continuously | Online with established connections |
| | | | Flashing green/red | Device is in communication faulted state and responding to an identify communication faulted request |
| 7 | Green/Red | UCS Status | Off | No power or hard/soft reset asserted |
| | | | Flashing red | Recoverable configuration fault (invalid firmware, OEM data, or personality data |
| | | | Red continuously | Hardware or fatal runtime error |
| | | | Flashing green | No errors; client interface is not open |
| | | | Green continuously | No errors; client interface is active |
| | | | Green and red continuously | Configuration mode |
| 9 | Yellow | Service | Yellow continuously | Bad node hardware |
| | | | Flashing once every 2 seconds | Power up/reset |
| | | | Flashing repeatedly | Watchdog timer resets occurring |
| | | | Flashing once every second | Node is unconfigured |
| | | | Flashes once, then off continuously | Normal at startup |
| 11 | Green | Power | Green continuously | Power is applied to the card |

# *Section C 2*
# Installation

**WARNING:** Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

**WARNING:** Risk of electric shock. Shut off and lock out system electrical power before performing the following procedures.

## Introduction

This section explains the procedures necessary to install the UCS DeviceNet interface card into an existing system. Disregard this section if the UCS DeviceNet interface card was installed at the factory.

## Installation

1. Open the main control cabinet door.

**WARNING:** This unit contains electrostatic sensitive devices (ESD). To prevent damage to ESD parts, wear a grounding wrist strap.

2. If a non-UCS DeviceNet card is installed in slot 9, remove the card and disconnect the card's solenoid wires. Refer to *Purge Panel* for more information.
3. Pull the top of the card's locking tab downward so that it is 90° from its original, locked position.
4. Orient the card in the position shown in Figure C 1-1.

   **NOTE:** The terminal blocks must be facing the front of the main control cabinet.

5. Carefully slide the card into slot 9 of the main control cabinet's card cage.
6. Push the card's locking tab upward to lock the card into the card cage.

# Wiring

## *Application Controller/PLC*

**NOTE:** The UCS DeviceNet interface card must use the Nordson DeviceNet interface cable, part 326138 (or Belden DeviceBus cable, part 3084A).

1. Make sure that the application controller/PLC network interface cable is routed into the main control cabinet through a strain relief in the top back section cabinet.
2. See Figure C 1-1. Connect the wires from the DeviceNet interface cable to the network interface terminal block (8).
   Refer to Table C 2-1 for the wiring sequence.

**NOTE:** Connect other devices (such as a photo eye junction box) to the network interface terminal block using a DeviceNet interface cable.

Table C 2-1 Application Controller/PLC Wiring

| Terminal | Wire Color | Function |
|---|---|---|
| BLK | Black | 24 V common |
| BLU | Blue | CANL |
| GRY | Gray (shield) | DeviceNet shield |
| WHT | White | CANH |
| RED | Red | 24 V positive |

3. Refer to Table C 2-2 for termination guidelines for your system. Terminate the DeviceNet interface cable at both ends of the network using a 121Ω resistor across the BLU and WHT terminals.

Table C 2-2 Network Termination Guidelines

| Operator Interface Type | Terminate the Interface Cable at the | See Figure |
|---|---|---|
| Sure Coat application controller | • application controller<br>• photo eye junction box | C 2-1 |
| PLC | • DeviceNet master (in the PLC)<br>• last device in the network | C 2-2 |

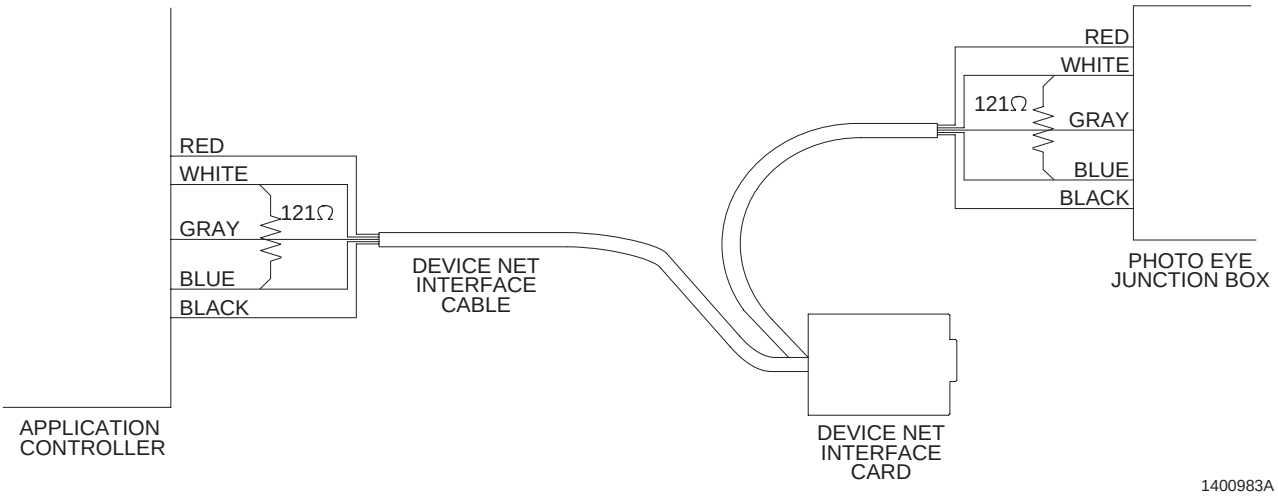


Figure C 2-1 Sure Coat Application Controller Network Termination

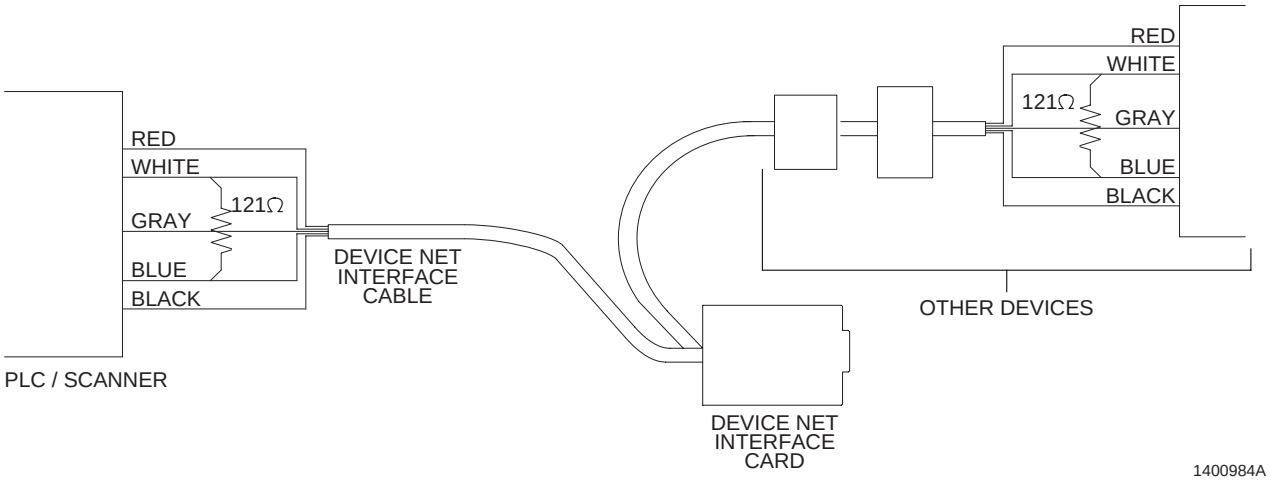


Figure C 2-2 PLC Network Termination

## *Purge Panel*

1. Make sure that the purge panel's wire groups are routed through the rubber grommet to the lower right of the card cage.
2. See Figure C 1-1. Connect the wiring from the purge panel to the purge terminal blocks (5). See Figure C 2-3 and refer to Table C 2-3 for the wiring sequence.

Table C 2-3 Purge Panel Wiring

| DeviceNet Terminal | Function | DeviceNet Terminal | Function |
|---|---|---|---|
| 1 | Not used | 7 | Not used |
| 2 | Not used | 8 | Not used |
| 3 | Not used | 9 | Not used |
| 4 | Not used | 10 | Not used |
| 5 | Gun purge solenoid 1 (positive) | 11 | Not used |
| 6 | Gun purge solenoid 1 (negative) | 12 | Not used |

# Wiring *(contd)*

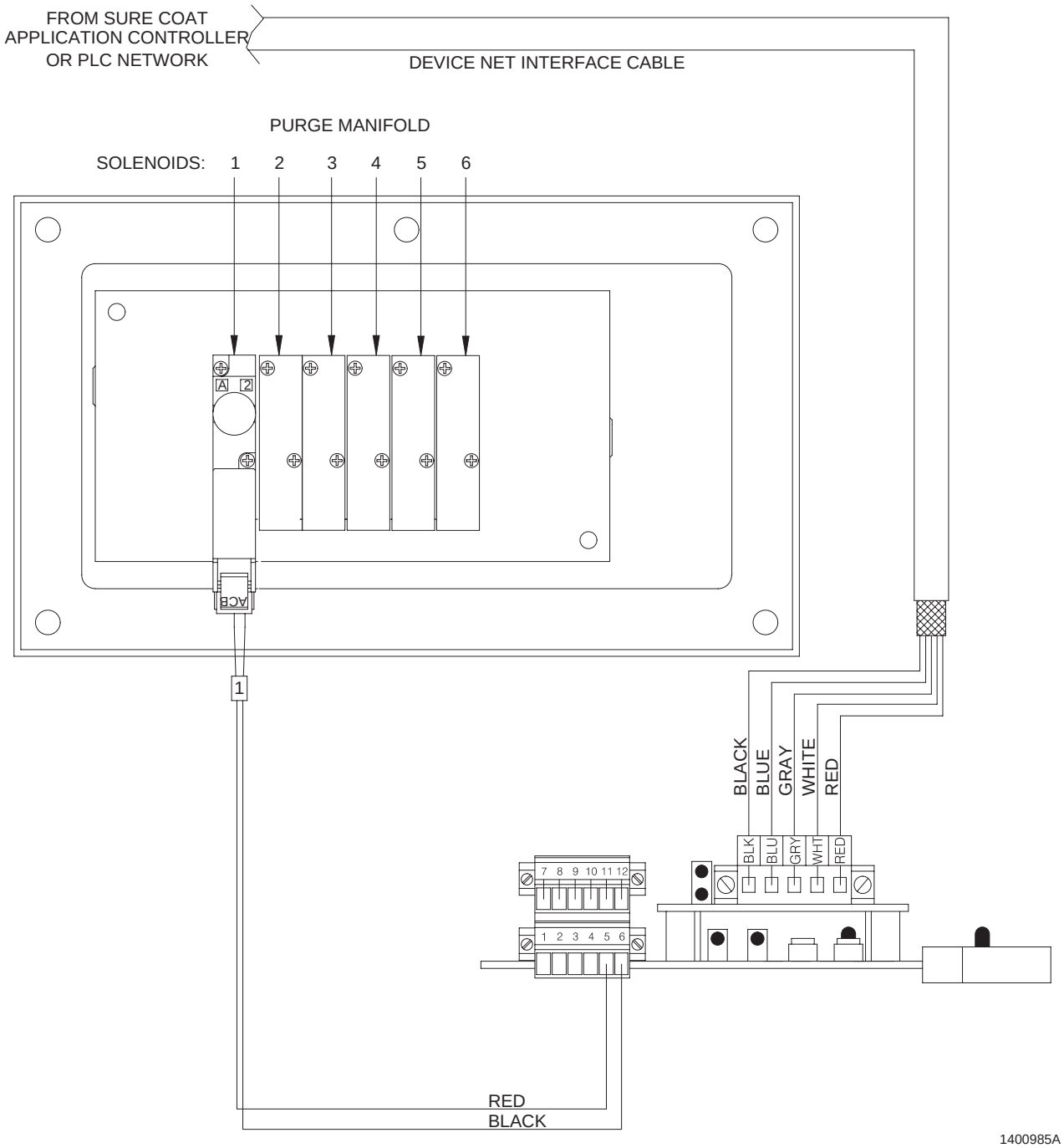


Figure C 2-3 UCS DeviceNet Interface Card Wiring Diagram

# Parts

| Part | Description | Note |
|---|---|---|
| 341626 | PCA, UCS DeviceNet, packaged | |
| 326138 | CABLE, DeviceNet interface, 4 conductor, 2-22, 2-24 | |