# CoreLink Network Connections

#### 1. Overview

#### 1.1. Introduction

1.1.1.CoreLink is a Hussmann case controller used in several Hussmann products. CoreLink is applied in display cases, unit coolers, walk-in boxes etc. It has multiple network options which are used for integrating with system managers and to enable some inter communication between controllers during some specific control schemes. This document outlines all the architectural options available for CoreLink.

## 1.2. Purpose

- 1.2.1.Main purpose of this document is to outline all the external network options, architecture, connections available on CoreLink. This is intended to be used by the field personnel and by the applications group when applying CoreLink for the stores.
- 1.2.2. This document does not include details about the integration registers and other information running in the system background. There is a separate document that covers that information which is intended for the development teams.

#### 2. General Information

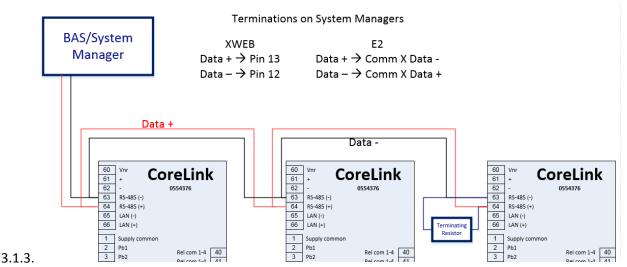
- 2.1. CoreLink has on board RS-485 communication which is used for all BAS/System manager Communication.
  - 2.1.1.Modbus RTU communication protocol is available on this Rs-485 port.
  - 2.1.2.System Managers like E2, XWEB, XM880 could use this as a standard communication medium to integrate with CoreLink without requiring any additional hardware.
  - 2.1.3.RS-485 pin numbers on CoreLink are the following
    - 2.1.3.1. Pin 63  $\rightarrow$  RS 485 –
    - 2.1.3.2. Pin 64  $\rightarrow$  RS 485+
- 2.2. CoreLink also has on-device USB port with a built-in web-server. Using USB to Ethernet adapter TCP/IP communications can be enabled.
  - 2.2.1.Modbus TCP/IP communication protocol is available on the CoreLink.
  - 2.2.2.Use Hussmann recommended USB-Ethernet adapters to enable TCP/IP communications.
  - 2.2.3.Some additional control functionalities are extended using this port.



RS - 485 Connections

#### 3. Network Modules

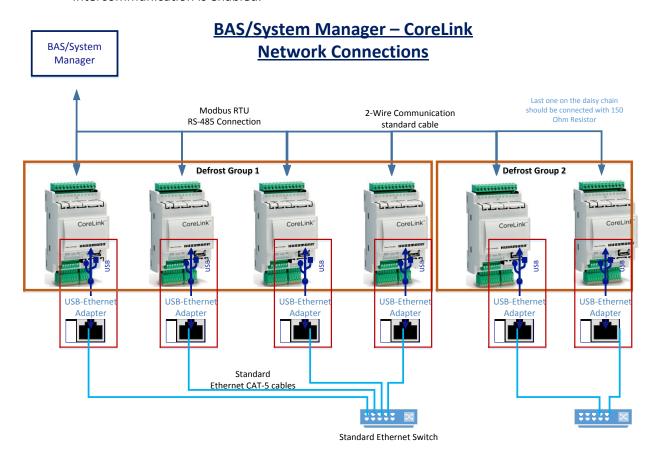
- 3.1. BAS Network Connections
  - 3.1.1. Following is some common general system manager network wiring connection layouts.
  - 3.1.2. Using a Terminating resistor of 150 Ohms is recommended on the final CoreLink on the daisy chain network.



- 3.2. Network Cable and wiring for Rs-485 network
  - 3.2.1. Following cables can be used for any 485 Data cabling between BAS/System managers to CoreLink.
    - 3.2.1.1. Belden 8641 (24AWG, 300V)
    - 3.2.1.2. Belden 8761 (22 AWG, 300V)
    - 3.2.1.3. Or 600V-shielded 22AWG equivalent
    - 3.2.1.4. Or any two-connector shielded twisted pair cable that support a maximum daisy chain cable length 4000 feet between the CoreLink and device manager.
  - 3.2.2.Ensure Cable is routed away from electrical noise generators and running in separation from high voltage wires.
- 3.3. Intercommunication between CoreLink controllers
  - 3.3.1.A group of cases next to each other in a line up are referred using any of the following names System Group, Defrost Group, Case Lineup etc.
  - 3.3.2.Additional control functionalities are enabled in CoreLink using inter communication between cases in the same System Group.
  - 3.3.3.This intercommunication between CoreLink's is enabled on the USB port. Additional USB Ethernet adapter is required to be added to CoreLink in scenarios where this additional control functionalities are necessary.
  - 3.3.4. Synchronizing defrosts in between cases in same system group can be enabled using this intercommunication.
- 3.4. Network data cable for Intercommunication between CoreLink
  - 3.4.1. Standard Cat5/5e cable can be used between CoreLink and ethernet switch for the cases
  - 3.4.2.Ensure Cable is routed away from electrical noise generators and running in separation from high voltage wires.

## 4. Complete Architecture

4.1. Following is the Complete network architecture when BAS communication and CoreLink intercommunication is enabled.



## 5. Additional Control Functions

- 5.1. Defrost Synchronization
  - 5.1.1. Synchronizing defrost among the cases in same lineup is critical for a smooth operation of display cases. This is much essential especially in low temperature units.
  - 5.1.2.Defrost synchronization ensures that cases in the line up next to each other go into defrost at the same time and terminate the defrost at the same time.
  - 5.1.3. CoreLink intercommunication could enable this feature on CoreLink controllers
  - 5.1.4.Additional Equipment needed
    - 5.1.4.1. USB to Ethernet adapters. Use Hussmann recommended adapters to ensure network dropouts and other network related issues.
    - 5.1.4.2. Standard Ethernet CAT-5 cables to connect between CoreLink controller and Ethernet switch.
    - 5.1.4.3. Standard Ethernet switch to connect the cables from CoreLink Controllers.
  - 5.1.5. Configurations
    - 5.1.5.1. CoreLink' s should be configured to manage the defrost synchronization.

      Software Configuration of CoreLink for defrost synchronization is described in a different document.