

Redundant System



9.1. Redundant System

P9-1-1



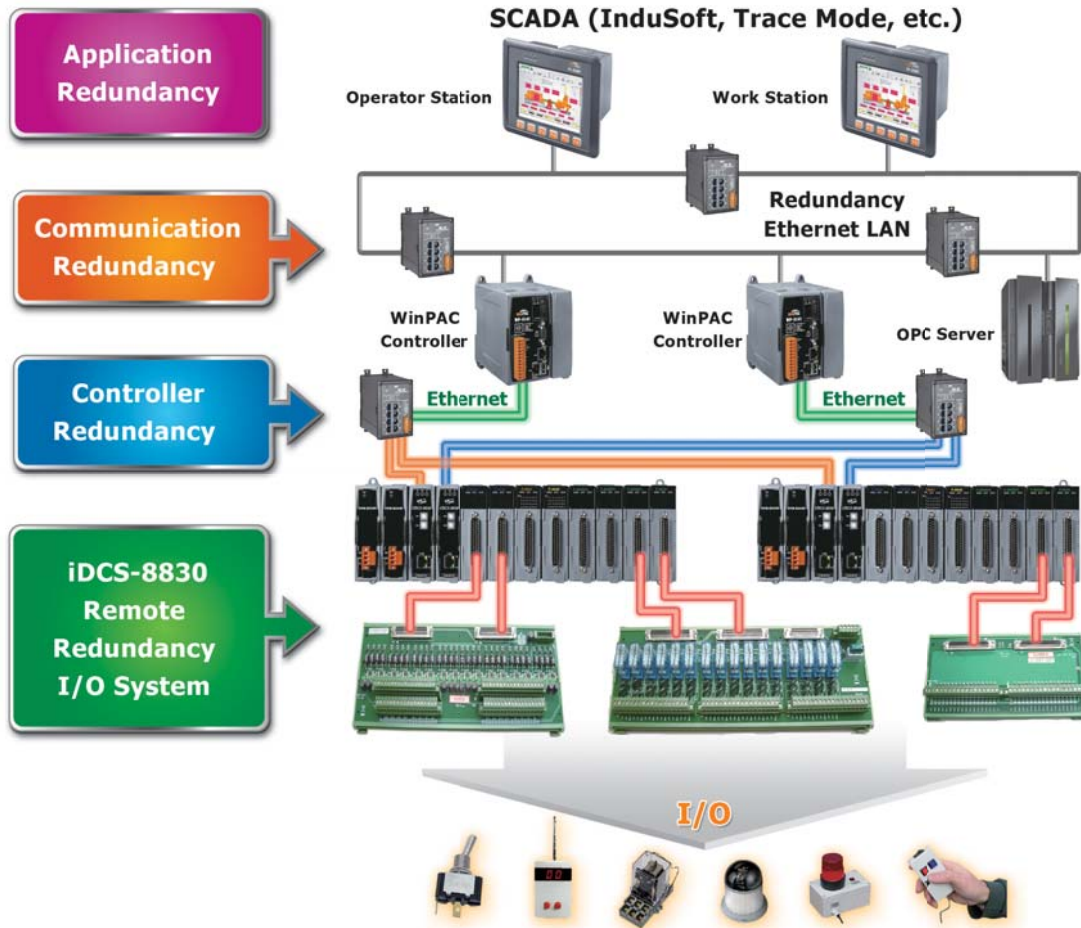
- Overview ----- P9-1-1
- iDCS-8830/iDCS-8830R ----- P9-1-3



9.1. Redundant System

• Overview

Redundancy is a common approach to improve the reliability and availability of a system, with cost increasing and higher complexity of system design. However, if the system is not reliable enough, redundancy may be an attractive option. For the need of these high reliable systems, ICP DAS provides the SCADA, Communication, Controllers and I/O redundant solutions.



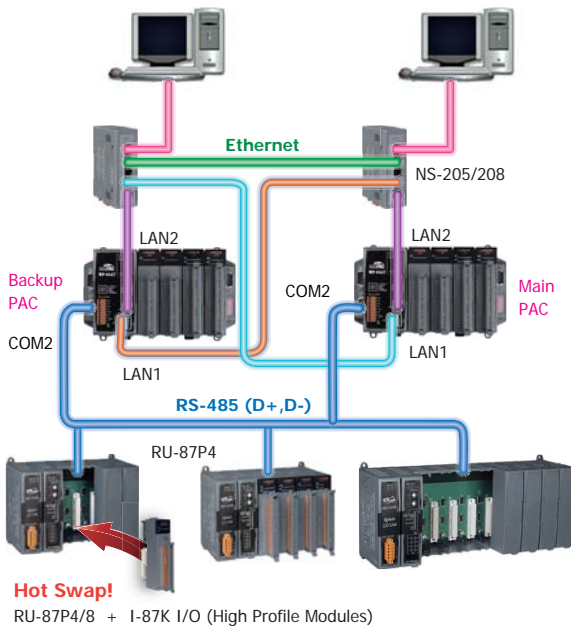
Product with Redundant function

Item	Product	Description
Redundant Application	SCADA (InduSoft, Trace Mode, etc.)	<ul style="list-style-type: none"> Deliver the powerful redundant HMI and SCADA software Support Web-based application Support for Secondary Database in the modes of "Redundancy" or "Store and Forward" HMI and SCADA systems
Redundant Communication	RS-405/RSM-405 RS-408/RSM-408 RS-405F/RSM-405F series RSM-405-R	<ul style="list-style-type: none"> Support up to 2 fiber and 8 Ethernet Recover from a copper link failure within approximately 20 ms 10/100 Mbps speed auto negotiation Redundant Power Inputs +10 ~ +30 V_{DC} Power failure alarm by relay output
Redundant Controller	WP-8xx7, XP-8047-CE6	<ul style="list-style-type: none"> Support IEC 61131-3 standard Redundancy switchover time is about 1 sec. Support Local I/O modules Redundant Power Inputs
Redundant I/O	iDCS-8000 series	<ul style="list-style-type: none"> Dual communication with Modbus TCP protocol Support redundant I/O modules up to 4 groups Hot Swap and Auto Configuration I/O modules Support Local I/O modules

1. Redundant PACs with RS-485 I/O

Features:

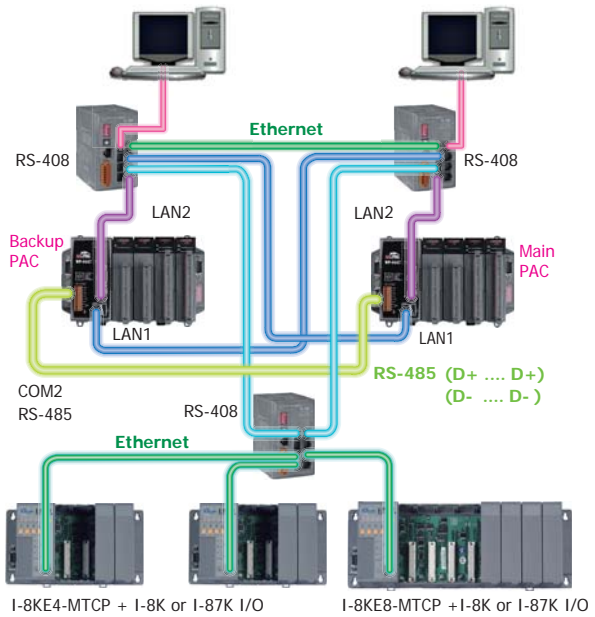
- Redundant PACs
- ISaGRAF PAC (WP-8xx7, XP-8047-CE6)
- Modbus TCP protocol for connecting PCs and PACs
- Redundancy switchover time is about 1 sec.
- RS-485 network for connecting PACs and I/O modules
- Hot Swap and Auto Configuration I/O modules



2. Redundant PACs with Ethernet I/O

Features:

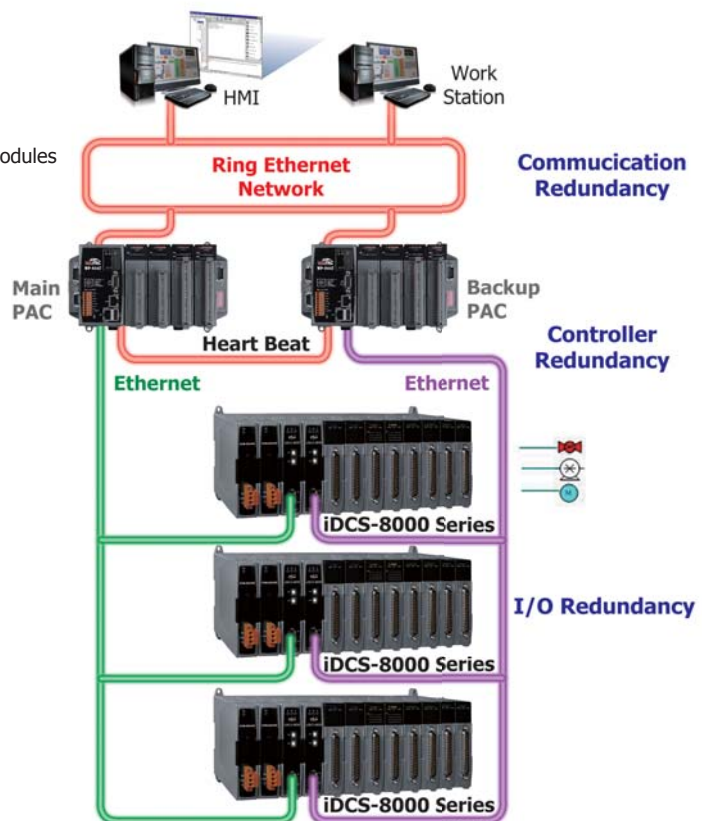
- Redundant PACs
- ISaGRAF PAC (WP-8xx7, XP-8047-CE6)
- Modbus TCP protocol for connecting PCs and PACs
- Redundancy switchover time is about 1 sec.
- Ethernet network for connecting PACs and I/O modules
- Hot Swap and Auto Configuration I/O modules



3. Redundant PACs with DCS I/O

Features:

- Redundant PACs
- Redundant Ethernet network for connecting PACs and DCS I/O modules
- Redundant power supply for DCS I/O modules
- Redundant DCS I/O modules
- ISaGRAF PAC (XP-8047-CE6)
- Modbus TCP protocol for connecting PCs and PACs
- Redundancy switchover time is about 1 sec.
- Ethernet network for connecting PACs and DCS I/O modules
- Hot Swap and Auto Configuration DCS I/O modules



Redundant System



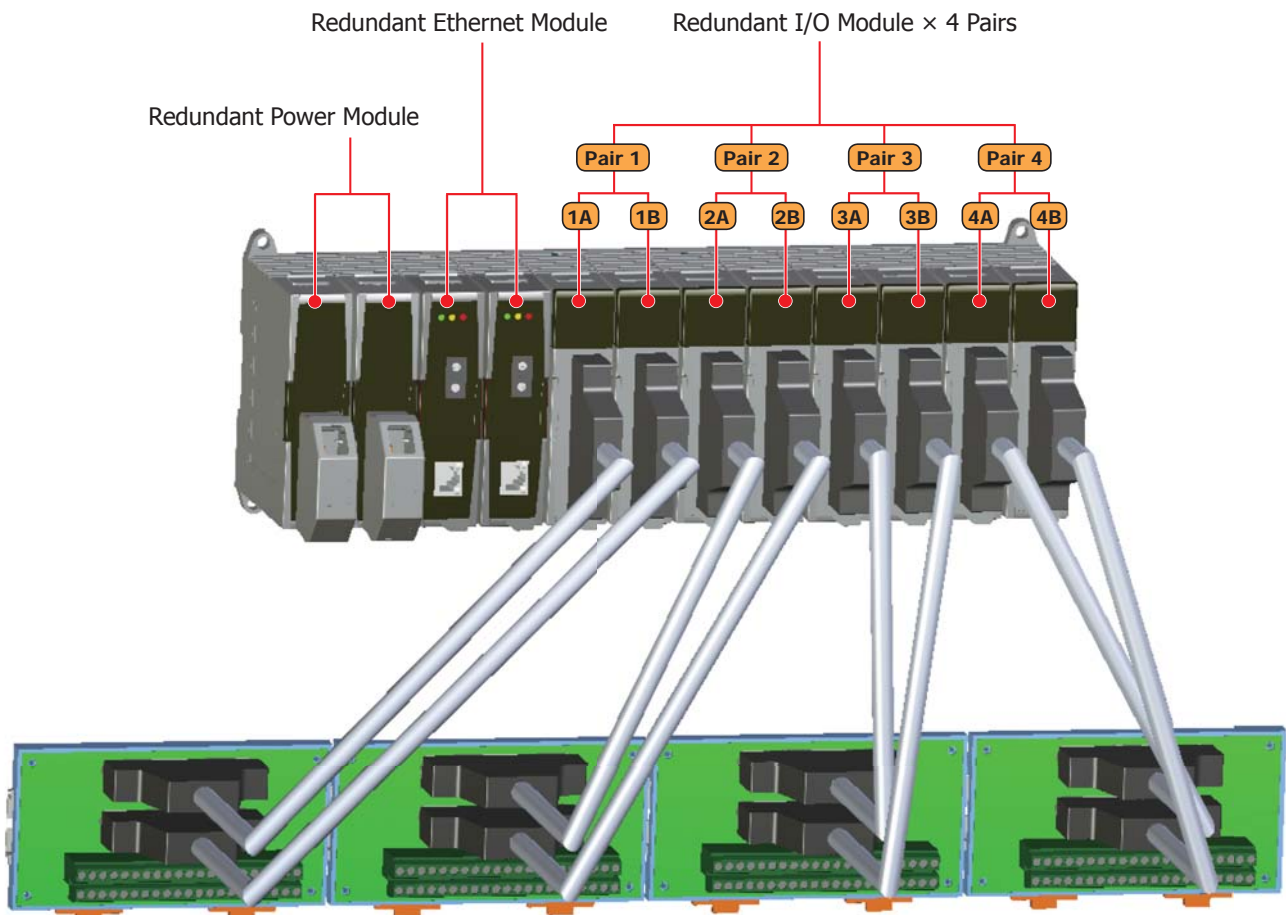
Features

- Support Modbus TCP protocol
- Support DI/DO/AI/AO/Counter/Frequency/HART modules
- Support redundant communication and power modules
- Support redundant I/O modules
- I/O configurable via the Ethernet
- Support Hot-swap and auto configuration
- Support power-on value and safe value for analog/digital output module
- Allows maximum of 4 clients access simultaneously
- Maximum 256 digital I/O in one iDCS-8830
- Maximum 64 analog output in one iDCS-8830
- Maximum 128 analog input in one iDCS-8830



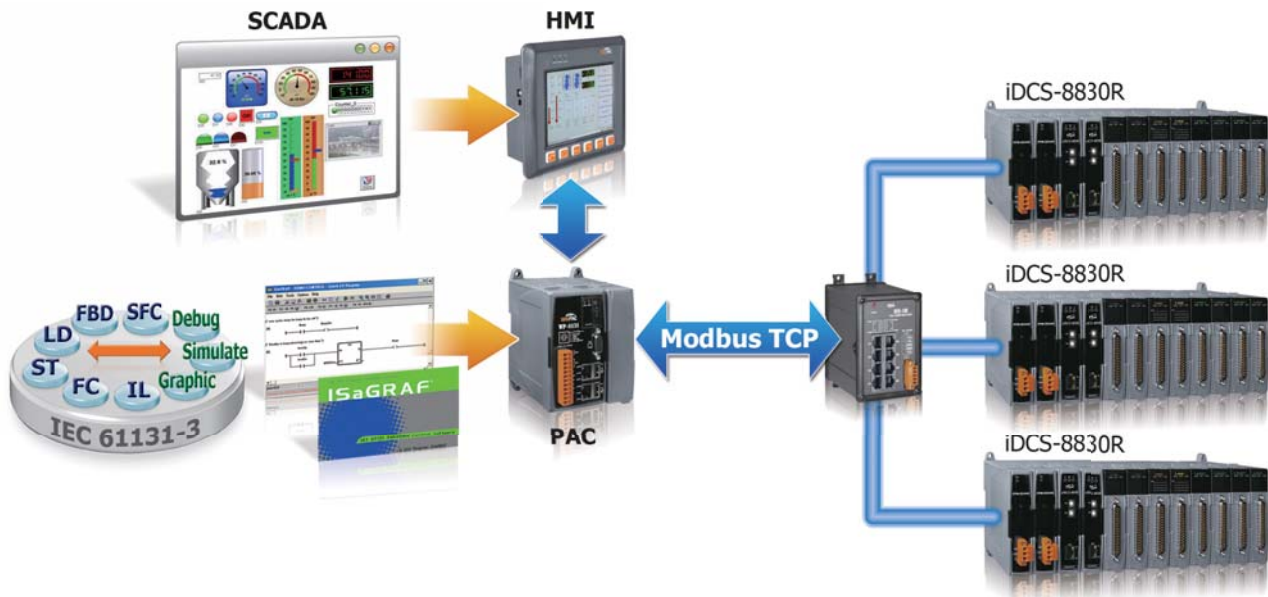
Introduction

The iDCS-8830 is a remote I/O unit in a dual redundant configuration with Modbus TCP protocol. Two communication processors and powers are installed in a backplane, which can install up to 8 I/O modules, such as DI, DO, AI, AO, PI, PO, HART... etc, of iDCS-8830. These I/O modules can be either configured as individual or redundant I/O modules, depending upon the actual requirement. There is up to 4 groups of redundant I/O modules can be used in the iDCS-8000 Series.



• **Ethernet based data acquisition I/O unit**

The iDCS-8830/iDCS-8830R is a remote Ethernet I/O unit supporting Modbus/TCP protocol. Specifically, the unit is used in industrial environment to control and acquire remote I/O device. As demand, it can be expanded to multiple remote I/O units. Moreover, due to the open Modbus TCP protocol, most SCADA software with built-in Modbus TCP Communication protocol can easily and quickly integrate the iDCS-8830 to the SCADA software as data acquisition and monitor onto the environment.



• **Refresh time of I/O**

The time of data interchange between the communication module and I/O module depends on the sampling rate of the I/O module.

• **Hot-Swap**

There is no need to shutdown or stop the system while changing or replacing modules.

• **Auto Configuration**

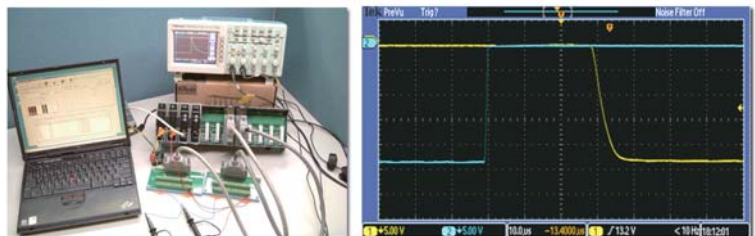
After module replacement, the last settings will be automatically configured.



• **High Speed for I/O Switch**

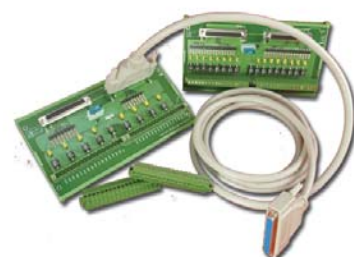
When master module is removed from any situation, the slave module would take over the work as soon as possible, and so the sensor or loader would not detect that switching.

Seamless I/O Redundant



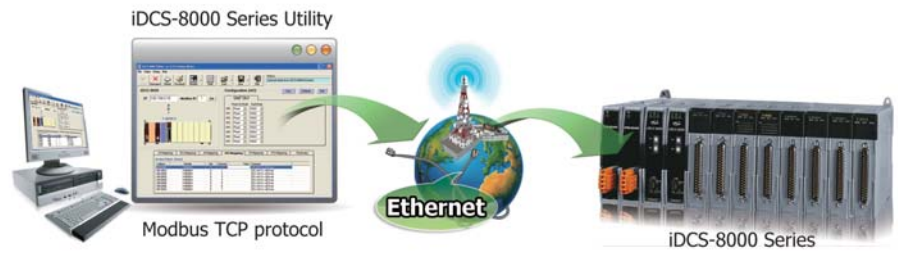
• **Dedicated Termination Board (Daughter Board)**

I/O module has a dedicated external terminal board and the cable which can reduce wiring time, installation effort/costs, and prevent wiring faults. Every Daughter Board has EMS protection and all terminators are removable.



Utility

- On-line configuration via Ethernet
- Configuration export/import
- Configure I/O modules parameters
- Auto scan/monitor I/O data and status
- Digital/Analog I/O output control
- Power-on value, safe value setting
- Event datalog



Specifications















Models	iDCS-8830	iDCS-8830R
System		
Communication protocol	Modbus TCP Slave	
Watchdog Timers	Yes (0.8 second)	
IP Address	Set by Rotary Switch	
LED Indicators	Yes	
Power-on Value and Safe value	Yes (programmable)	
Communication Ports		
COM 1	RS-232 (to update firmware)	
Ethernet Port	RJ-45 x 2, 10/100 Base-TX (Auto negotiating, Auto MDI/MDI-X, LED indicators)	
I/O Expansion Slots		
Slot Number	8	
Hot Swap	Yes	
Auto Configuration	Yes	
I/O redundancy	Max 4 groups I/O Redundancy (programmable)	
Mechanical		
Dimensions (W x L x H)	374 mm x 132 mm x 100 mm	
Installation	DIN-Rail or Wall Mounting	
Environmental		
Operating Temperature	-25 ~ +75°C	
Installation	-30 ~ +80°C	
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)	
Power		
Input Range	+10 ~ +30 Vdc	
Isolation	1 kV	
Protection	Power reverse polarity protection	
Short Circuit Protection	Yes	
Capacity	40 W	

Ordering Information

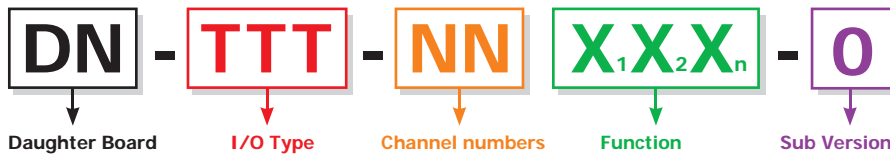
Type	Pictures	Model Name	Description
Single Unit		iDCS-8830	1 × Power (FPM-D2440) + 1 × Communication Module(FCM-MTCP) + 1 × 8 I/O slot Backplane
Redundancy Unit		iDCS-8830R	2 × Power (FPM-D2440) + 2 × Communication Module(FCM-MTCP) + 1 × 8 I/O slot Backplane

I/O Module Selection Guide



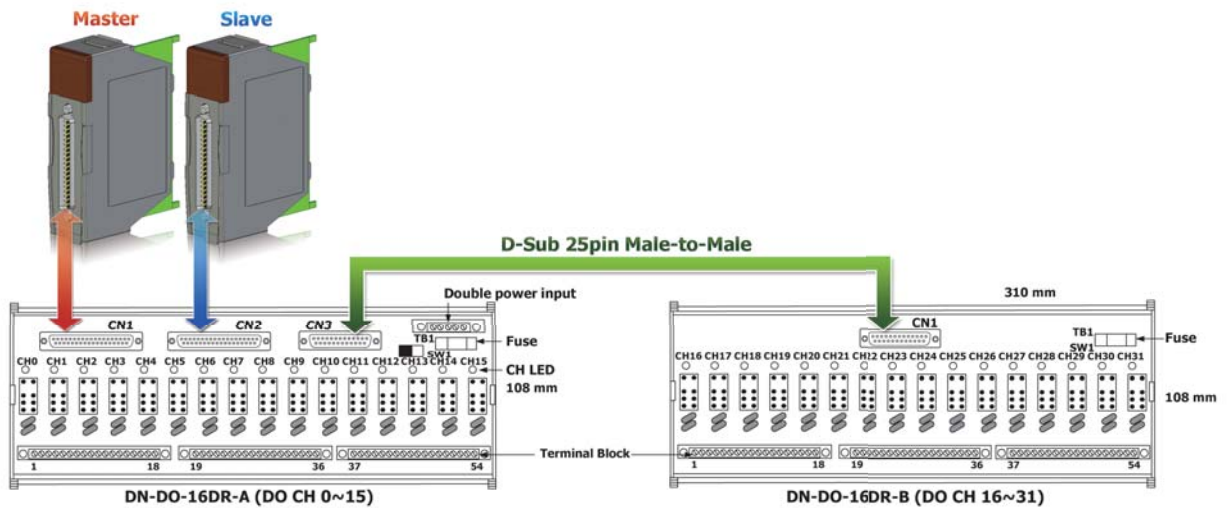
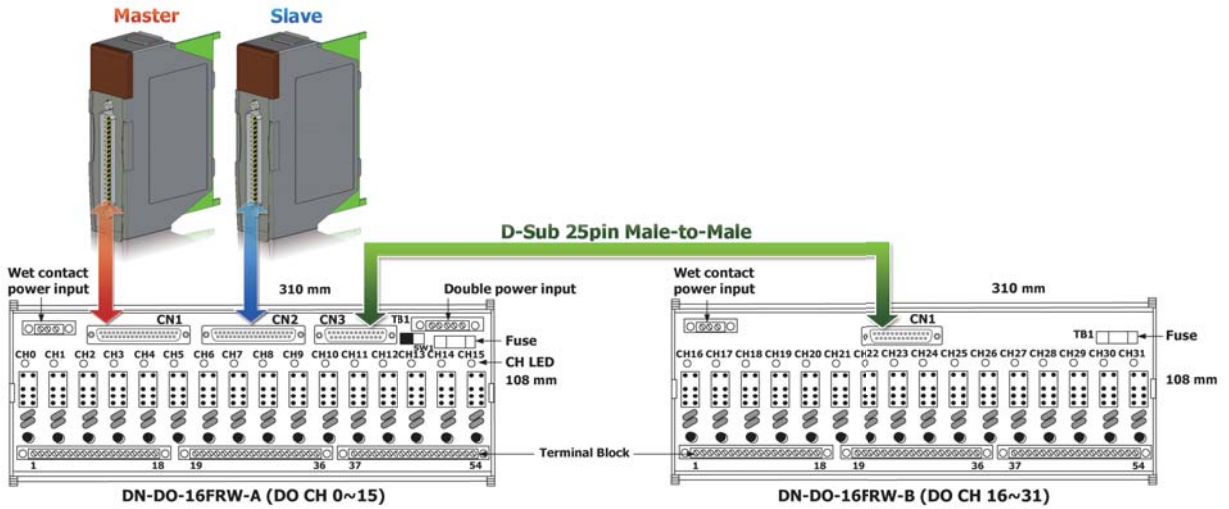
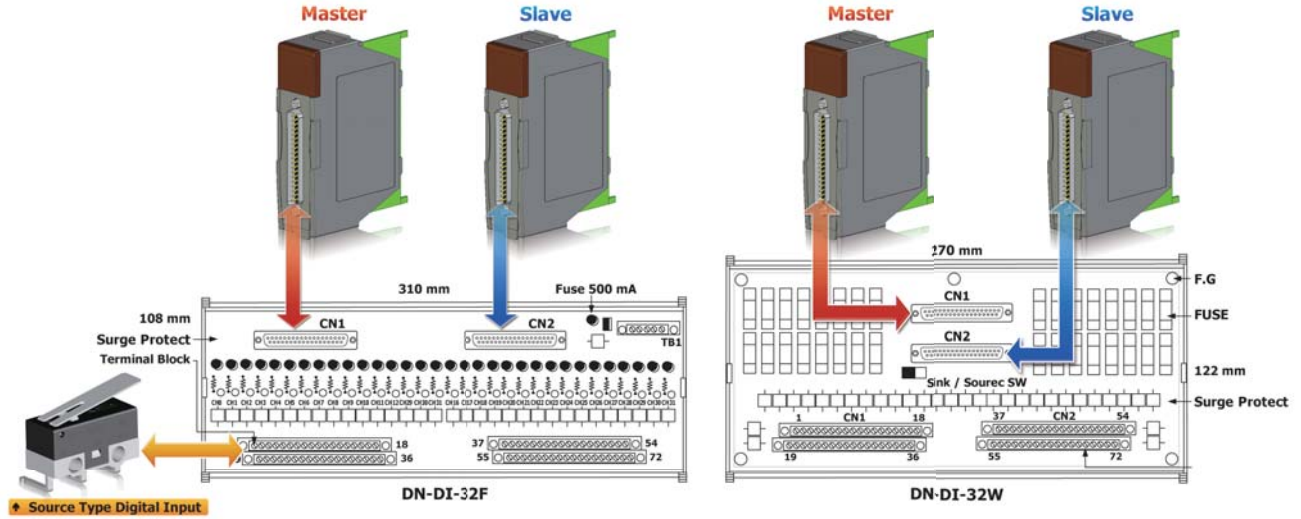
Type	Name	Pictures	Description	Terminal Board	
Power Module	FPM-D2440		18 ~ 30 V _{dc} Input, 3 5W @ 5 V _{dc} Output and 120W @ 24 V _{dc} Output.	-	
Communication Module	FCM-MTCP		Support Modbus TCP/IP Protocol and Module Auto-configuration.	-	
Digital	DI	F-8040		32-channel DI (Sink/Source Type) Module, One Common for 32-channel,LED Display.	DN-DI-32F DN-DI-32W
	DO	F-8041		32-channel DO (Sink Type) Module, Open-collector(NPN),LED Display.	DN-DO-16DR-A DN-DO-16DR-B DN-DO-16FRW-A DN-DO-16FRW-B
		F-8041P		16-channel ONESHOT Mode /Continuous Mode, One COM for 32-channel.	
Pulse	PI	F-8084		8-channel PI(Source/Sink Type) Module, Maximum input Frequency: Single 500KHz /Duplex 10KHz	DN-PI-08
Analog I/O	AII	F-8017C1		8-channel Single-End/Differential Current Input Module, Support 24 V _{dc} Power Output.	DN-AIO-08F
		F-8017C2		16-channel Differential Current Input.	DN-AIO-16F
		F-8017CH		8-channel Single-End/Differential Current Input Module, Support 24 V _{dc} Power Output and HART Protocol.	DN-AIO-08F
	AIV	F-8017V		8-channel Differential Voltage Input	DN-AIO-08F
	AO	F-8028CV		8-channel Voltage/Current Output Module, One GND for 8 ch.	DN-AIO-16F
		F-8028CH		8-channel Current Output Module, Support 24 V _{dc} Power Output and HART Protocol.	DN-AIO-08F
Temperature	RTD	F-8015		8-channel RTD (3-Wire) Module, Support Sensor Type: Pt100, Pt1000, JPt100	DN-RTD-08
	TC	F-8019		8-channel Differential Thermocouple (J, K, T, E, R, S, B, N, C) and Voltage Input.	DN-TC-08

Termination Board



I/O Type	DI, DO, AI, AO, AIO, TC, RTD etc...
Function	D: Dry Contact
	W: Wet Contact
	F: EMS Protect
	R: Relay Board

Termination Board for Digital I/O

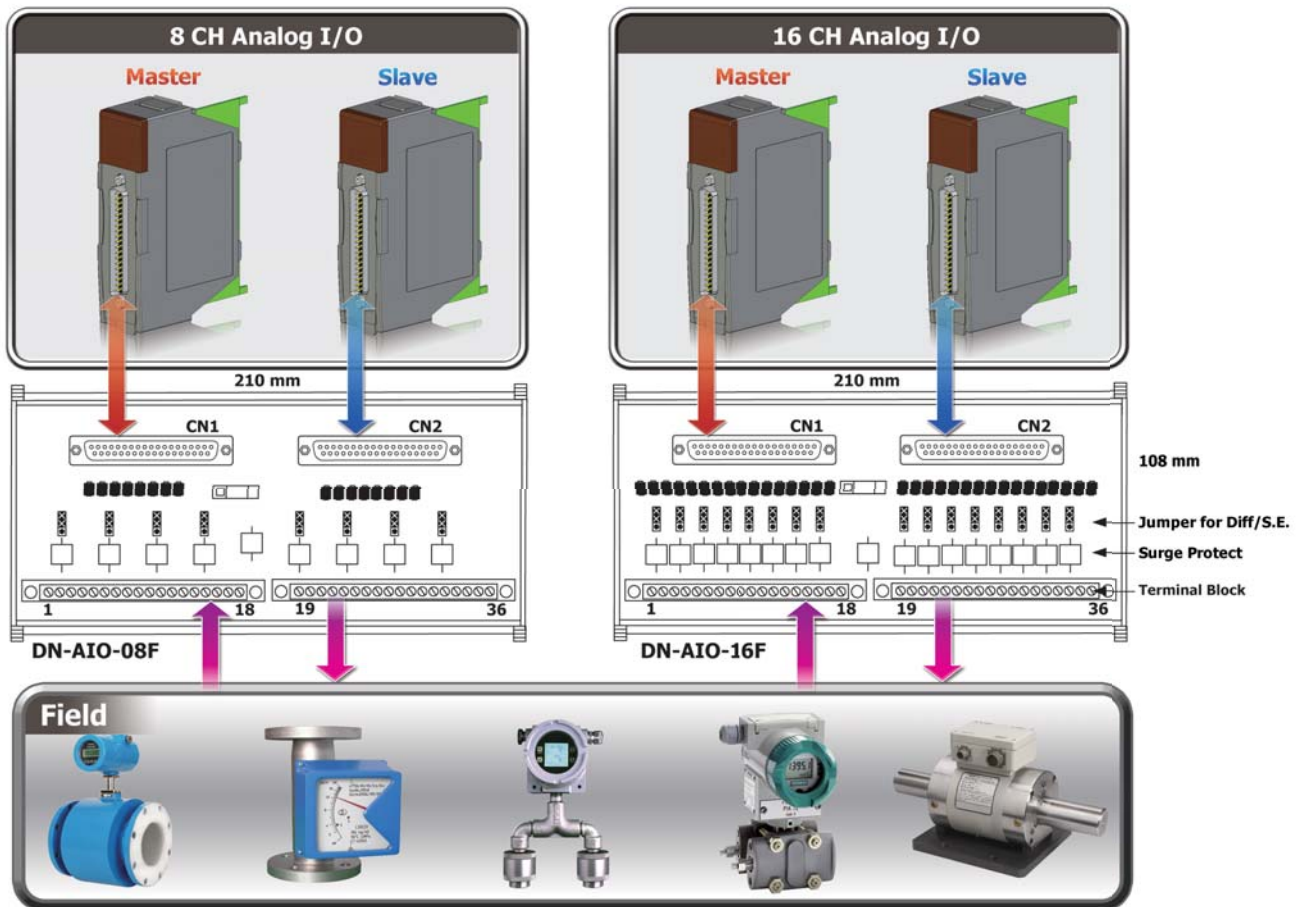


Model Name	Function Description	Support I/O
DN-DI-32F	<ul style="list-style-type: none"> 32-channel Digital Input(Source Type)with LED Display. EMS Protection All channels have the 100mA fuse to protect overload, and the fuse is replaceable. 	F-8040
DN-DI-32W	<ul style="list-style-type: none"> 32-channel Digital Input.(Both of Sink and Source Type) EMS Protection All of channels have the 320mA fuse to protect overload The fuse have the broke alarm and can be replaced. 	F-8040
DN-DO-16DR-A DN-DO-16DR-B	<ul style="list-style-type: none"> 16-channel Relay Output (Form C, AC/DC , 6A/per channels) (Dry Contact) with LED Display. EMS Protection Board A Support F-8041's channel 0 ~ 15. Board B Support F-8041's channel 16 ~ 31 and must attached to DN-DO-16DR-A or DN-DO-16FRW-A. 	F-8041
DN-DO-16FRW-A DN-DO-16FRW-B	<ul style="list-style-type: none"> 16-channel Relay Output (Form C, AC/DC, 2A/per channels) (Wet Contact) with LED Display. All channels have the 2A fuse in the secondary side to protect overload. The wet power input supports AC or DC. EMS Protection A board is controlled by the F-8041's channel 0 ~ 15. B board is controlled by F-8041's channel 16 ~ 31 and it is must be attached to DN-DO-16DR-A or DN-DO-16FRW-A. 	F-8041

Termination Board for Pulse I/O Module

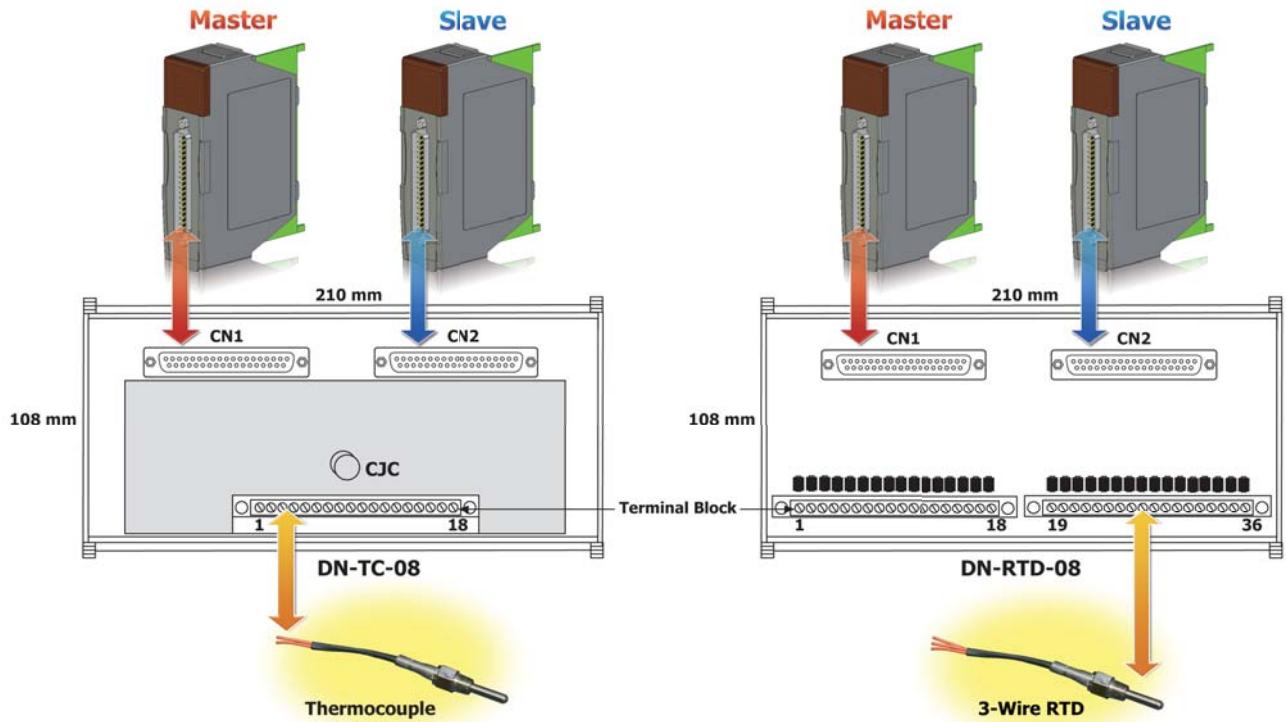
Model Name	Function Description	Support I/O
DN-PI-08	<ul style="list-style-type: none"> 8-channel pulse input Support 2wire, 3wire ,4 wire connection 	F-8084

Termination Board for Analog I/O Module



Model Name	Function Description	Support I/O
DN-AIO-08F	<ul style="list-style-type: none"> 8-channel Analog Input or Output. EMS Protection Jumper select channel Differential or Single-End wiring. 	F-8017C1 F-8017H F-8017V F-8028CH
DN-AIO-16F	<ul style="list-style-type: none"> 16-channel Analog Input or Output. EMS Protect (Include >4KV Surge, ESD, etc..) Jumper select channel Differential or Single-End wiring. 	F-8017C2 F-8028CV

Termination Board for Temperature I/O Module



Model Name	Function Description	Support I/O
DN-TC-08	<ul style="list-style-type: none"> 8-channel TC. CJC Compensate. 	F-8019
DN-RTD-08	<ul style="list-style-type: none"> 8-channel 3wire RTD. 	F-8015

General Termination

Model Name	Function Description	Support I/O
DN-37-A	<ul style="list-style-type: none"> D-Sub 37pin Connector to I/O Connector Block 	ALL

Components

Type Name	Model Name	Description
Blank I/O Module	4SIPP-801W-CAG	Blank I/O Module
Rackmount kit	FRMK	Install iDCS-8000 series in the 19 inch-rack.
Cable	CA-01	D-Sub 37pin Female-Male 1m Cable, 24AWG, 180, UL-2464
	CA-02	D-Sub 37pin Female-Male 2m Cable, 24AWG, 180, UL-2464
	CA-03	D-Sub 37pin Female-Male 3m Cable, 24AWG, 180° UL-2464
	CA-05	D-Sub 37pin Female-Male 5m Cable, 24AWG, 180° UL-2464
	CA-10	D-Sub 37pin Female-Male 10mCable, 24AWG, 180° UL-2464
	CA-2510D	D-Sub 25pin Male-Male 1m Cable, 28AWG, 180, UL-2464
	CA-2520D	D-Sub 25pin Male-Male 1.8m Cable, 28AWG, 180, UL-2464

