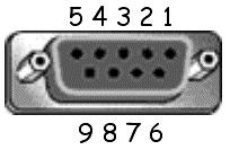
independently. Standard Nexus system design applies dual redundant I/O networks (R net and S net), to meet the requirements of redundant bus communication and redundant power supply for I/O modules. For non-critical application, or per customer's specific requirement, simplex I/O network can also be applied. In such a case, the I/O system will lose communication and power supply redundancy. The iLink cable is standardized and I/O networks are different in cable colour, black represents "Net R" and white represents "Net S". A DB-9 connector is used to connect bus and the I/O module, female – bus, male – I/O module. The pin definition of the connector is as follows:

Table 2.2-1 iLink Connector Pin Definition

Bus connector	Network	Pin	Signal	Description
 iLink connector (female)	iLink R	1	R_link+	iLink Net R data+
		2	R_24V+	24V dc A+
		3	R_24V+	24V dc A+
		4	GND	Ground
		5	GND	Ground
		6	R_link-	iLink Net R data-
		7	R_24V+	24V dc A+
		8	GND	Ground
		9	GND	Ground
 I/O module connector (male)	iLink S	1	S_link+	iLink Net S data+
		2	S_24V+	24V dc B+
		3	S_24V+	24V dc B+
		4	GND	Ground
		5	GND	Ground
		6	S_link-	iLink Net S data-
		7	S_24V+	24V dc B+
		8	GND	Ground
		9	GND	Ground

GE provides the following types of iLink cable:

GE Item Code	Name	Description
388A2995G2101	iLink12B	iLink Cable, w/ connectors for 12 IO Module, Black
388A2995G2102	iLink12W	iLink Cable, w/ connectors for 12 IO Module, White
388A2995G2103	iLink6B	iLink Cable, w/ connectors for 6 IO Module, Black
388A2995G2104	iLink6W	iLink Cable, w/ connectors for 6 IO Module, White
388A2995G2105	iLink3B	iLink Cable, w/ connectors for 3 IO Module, Black
388A2995G2106	iLink3W	iLink Cable, w/ connectors for 3 IO Module, White

As shown in Fig 1.1-1, integrated I/O networks also include associated I/O bus & power extension modules, as well as controller iLink extension cables. For a detailed network connection scheme, please refer to ***GEK-118586 Nexus Hardware Manual***.

2.2.3 I/O Module

The Nexus I/O module is an intelligent I/O module. The module adopts single board design which contains a processor subsystem and an acquisition circuit, to complete field process data acquisition, digitalization, control algorithm, control output and bi-directional real-time communication with the controller.

As a result of the uniquely designed circuit and on-board software (firmware), the Nexus I/O module can also provide full-level self-diagnostics, from module level to channel level. These diagnostics cover the processor subsystem, I/O bus communication, power management and I/O channels. Diagnostic results can be displayed by the module's status LEDs while also transmitted to the controller to be viewed as an alarm displayed on the HMI screen.

Each Nexus I/O module has its unique physical address within each iLink, and it can be set by the module's address jumper. Through air heat convection, the module can work between 0~60 °C (32~140 °F) ambient temperature. The module's processor contains a temperature sensor which can be used to acquire actual temperature on the electrical circuit board (measurement accuracy ±5 °C /±9 °F). The acquired data will be transferred to the controller via I/O link by the I/O module.

For detailed information about the I/O module, please refer to ***GEK-118586 Nexus Hardware Manual***.

Fig 2.2-2 Nexus I/O Module

Field signals are interfaced to the control system via the I/O module terminal blocks (TB). Each I/O module has several TBs with the actual quantity depending on the module type. Each TB is a removable single-row Euro-style with 16 pins (or different, depends on module type) and each pin can hold one 2.05mm (#12AWG) wire, or two 1.63mm (#14AWG) wires. TB pitch is 5.08mm (0.2") with 2000VAC insulation withstands voltage.

I/O modules are installed in the cabinet in two columns. The DO module and the associated extension relay board which are used for large capacity DC control circuit are mounted adjacently, with modules above relay boards. Front and rear grounding bars are provided on the bottom of the cabinet and adjacent to the cabinet entrance of field cables for shield grounding.

Table 2.2-2 Nexus I/O Module

GE Item Code	Name	Description
369B1841G5006	MAI50	16-Channel mA/V Analog Input Module
369B1841G5007	MAI51	16-Channel TC/RTD Analog Input Module
369B1841G5008	MHT50	8-Channel mA/V Analog Input HART Module
369B1841G5009	MAI52	8-Channel mA/V Analog Input Module
369B1842G5004	MHO50	8-Channel Analog Output HART Module
369B1842G5005	MAO50	8-Channel Analog Output Module
369B1843G5003	MDI50	32-Channel Discrete Input Module, and 4 channels can be configured for pulse input
369B1843G5005	MDI52	16-Channel Discrete Input Module, and 4 channels can be configured for pulse input
369B1844G5004	MDO53	16 –Channel Discrete Output Module w/ Relay Output
369B1844G5005	MDO54	16 –Channel Discrete Output Module, extension relay board is required for application
369B1851G5002	MSP50	Speed Measurement and Overspeed Protection Module
369B1851G5003	MSP51	Speed Measurement and Logic Protection Module
369B1848G5007	MVP50	Valve Position Control Module
369B1852G0007	MLP50	TMR Redundant Logic Control Module
369B1877G0007	BLP50	Programmable Logic Protection Base