4-5 Intelligent Communication Controllers

I-752N Series

Programmable Intelligent Communication Controller

Features

- Built-in "Addressable RS-485 to RS-232 Converter" firmware
- Supports about 30 well-defined commands
- Supports power-up and safe value for DO
- R.O.C. Invention Patent No. 086674, No.103060 and No. 132457
- Programmable Intelligent Communication Controller
- Supports Dual-Watchdog commands
- Watchdog timer provides fault tolerance and recovery
- Low power consumption
- Made from fire-retardant materials (UL94-V0 Level)

Introduction

There are many RS-232 devices in industry applications. Nowadays it becomes important to link all those RS-232 devices together for automation and information. Usually those RS-232 devices are far away from the host-PC and widely distributed in the factory. So it is not a good idea to use multi-serial cards to connect all these RS-232 devices together. The I-752N series product can be used to link multiple RS-232 devices by a single RS-485 network. The RS-485 is famous for its easy maintenance, simple cabling, stable, reliable and low cost.

Onboard 1 KB Queue buffer

The I-752N series module is equipped with a 1 KB queue buffer for its local RS-232 device. All input data can be stored in the queue buffer until the Host PC has time to read it. This feature allows the Host PC to link thousands of RS-232 devices without any loss of data.

3000V isolation on RS-485 side

COM2 of the I-752N modules is an isolated RS-485 port with 3000 V_{DC} isolation, which protects the local RS-232 devices from transient noises coming from the RS-485 network.

Self-Tuner ASIC inside

The built-in Self-Tuner ASIC on an RS-485 port can auto detect and control the send/receive direction of the RS-485 network. Thus, there is no need for application programs to be concerned about direction control of the RS-485 network.

Can be used as Addressable RS-485 to RS-232 Converter

Most RS-232 devices don't support device addressing. The ICP DAS I-752N module assigns a unique address for each RS-232 device installed. When Host PC sends a command with a device address to the RS-485 network, the destination I-752N module will remove the address field, and then pass the other commands to the specified local RS-232 devices. The response from the local RS-232 devices will be returned to the Host PC via the I-752N.

Master-type Addressable RS-485 to RS-232 Converter

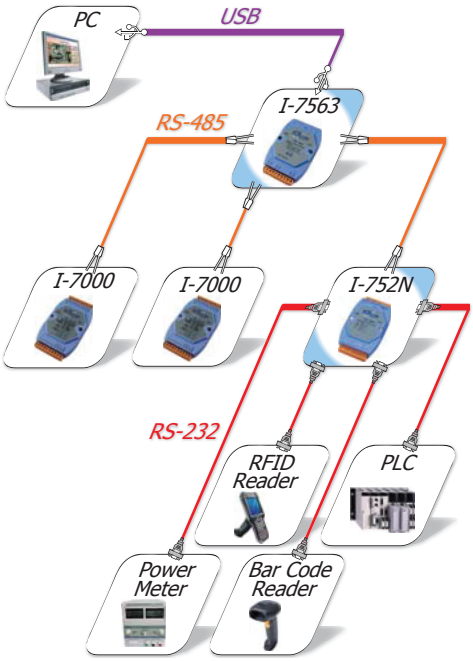
The ICP DAS I-752N product is unique that they are Master type converters which use our R.O.C. Patent 086674, while most other converters are Slave-type, which are helpless without a Host PC. In real industrial applications, many users are not satisfied with Slave-type converters as they cannot be adapted to individual requirement. The powerful I-752N series analyzes the local RS-232 devices, DI and DO without the need for a Host PC. Refer to Applications 5 ~ 9 for more information in the manual.

Can be used as RS-232 to RS-485 Device Server

The Device Server is an appliance that networking any device with a serial communication port. The I-752N series Intelligent Communication Controller allows the RS-232 serial devices to connect to the RS-485 network. Also, there are PDS series products available from ICP DAS, which provide Ethernet connectivity for serial devices.

Applications

- Factory Automation
- Building Automation
- Home Automation



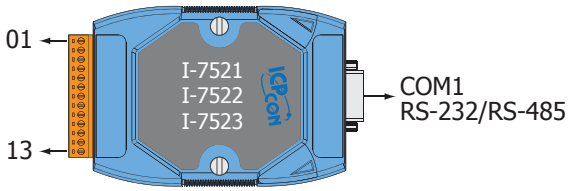
I/O Specifications

Models	I-7521(D)	I-7522(D)	I-7523(D)	I-7522A(D)	I-7524(D)	I-7527(D)
User-Defined I/O						
I/O Channel	3	–	–	–	–	–
Digital Output						
DI Channel	2	2	1	5	1	1
Input Type	Source (Dry Type), Common Ground, non-isolated					
Off Voltage	+1 V max.					
On Voltage	+3.5 VDC ~ +30 VDC					
Digital Output						
DO Channel	3	1	–	5	1	1
Output Type	Open Collector (Sink/NPN), non-isolated					
Load Voltage	+30 VDC max.					
Load Current	100 mA max.					

System Specifications

Models	I-7521(D)	I-7522(D)	I-7523(D)	I-7522A(D)	I-7524(D)	I-7527(D)
System						
CPU	80188, 20 MHz					
SRAM	128 KB					
Flash	512 KB					
EEPROM	2 KB					
Real-Time Clock	–					
Watchdog Timer	Yes					
Operating System	MiniOS7					
Communication Interface						
COM1	5-wire RS-232 or 2-wire RS-485					
COM2	Isolated 2-wire RS-485			2-wire RS-485		
COM3	–	5-wire RS-232	5-wire RS-232	4-wire RS-422	5-wire RS-232	3-wire RS-232
COM4	–	–	3-wire RS-232	–	5-wire RS-232	3-wire RS-232
COM5	–	–	–	–	5-wire RS-232	3-wire RS-232
COM6	–	–	–	–	–	3-wire RS-232
COM7	–	–	–	–	–	3-wire RS-232
COM8	–	–	–	–	–	3-wire RS-232
Baud Rate	300 ~ 115200 bps					
Data Bit	COM1 ~ COM2: 7 or 8					
	COM3 ~ COM8: 5, 6, 7 or 8					
Parity	COM1 ~ COM2: None, Even, Odd					
	COM3 ~ COM8: None, Even, Odd, Mark , Space					
Stop Bit	COM1 ~ COM2: 1 or 2 (data bit must be 7)					
	COM3 ~ COM8: 1 or 2					
Connector	Male DB-9 x 1 13-Pin screw terminal block x 1 (for 16 ~ 26 AWG wires; 3.81 mm pitch)			14-Pin screw terminal block x 2 (for 16 ~ 22 AWG wires; 3.5 mm pitch)		
LED Indicators						
LED Display	5-digit 7-segment LED display for D versions					
Power						
Protection	Power input reverse polarity protection					
Power Requirement	Unregulated +10 VDC ~ 30 VDC					
Power Consumption	2 W (without display), 3 W (with display)					
Mechanical						
Casing	Plastic					
Flammability	Fire-Retardant Materials (UL94-V0 Level)					
Dimensions (W x H x D)	72 mm x 118 mm x 35 mm			72 mm x 120 mm x 35 mm		
Installation	DIN-Rail Mounting					
Environment						
Operating Temperature	-25 °C ~ +75 °C					
Storage Temperature	-40 °C ~ +80 °C					
Humidity	0 ~ 90% RH, non-condensing					
Note: 3-wire RS-232: RxD, TxD, GND 5-wire RS-232: RxD, TxD, CTS, RTS, GND 2-wire RS-485: DATA+, DATA-, GND; Self-Tuner inside Isolated 2-wire RS-485: DATA+, DATA-; Self-Tuner inside; 3000 VDC Isolation 4-wire RS-422: RxD+, RxD-, TxD+, TxD-, GND						

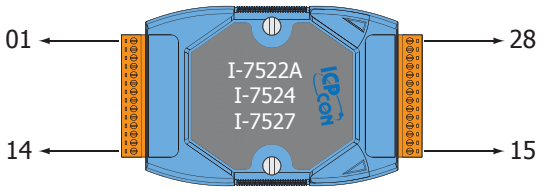
Pin Assignments



Terminal No.		Pin Assignment
	01	X3
	02	X2
	03	X1
DO	04	DO3
	05	DO2
	06	DO1
DI	07	DI3
	08	DI2
	09	INIT*
COM2	10	(Y)D2+
	11	(G)D2-
Power Input	12	(R)+Vs
	13	(B)GND

Pin Assignment		Terminal No.	Pin Assignment
GND	05	09	Data-
N.C.	04	08	RTS
RxD	03	07	CTS
TxD	02	06	N.C.
Data+	01		

COM1: RS-232
Male DB-9 Connector



Terminal No.		Pin Assignment
DO	01	DO
DI	02	DI
COM1	03	D1+
	04	D1-
	05	CTS1
	06	RTS1
	07	GND
	08	TxD1
	09	RxD1
	10	INIT*
COM2	11	(Y)D2+
	12	(G)D2-
Power Input	13	(R)+Vs
	14	(B)GND

X507		
Terminal No.		Pin Assignment
DO	28	DO3
	27	DO2
	26	DO1
	25	DO0
	24	DO.PWR
	23	GND
DI	22	DI3
	21	DI2
	20	DI1
	19	DI0
COM3	18	RxD3-
	17	RxD3+
	16	TxD3-
	15	TxD3+

Terminal No.		Pin Assignment
COM3	01	CTS3
	02	RTS3
	03	RxD3
	04	TxD3
	05	GND
DO	06	DO1
DI	07	DI3
	08	DI2
	09	INIT*
COM2	10	(Y)D2+
	11	(G)D2-
Power Input	12	(R)+Vs
	13	(B)GND

Pin Assignment		Terminal No.	Pin Assignment
GND	05	09	Data-
N.C.	04	08	RTS
RxD	03	07	CTS
TxD	02	06	N.C.
Data+	01		

COM1: RS-232
Male DB-9 Connector

Terminal No.		Pin Assignment
DO	01	DO
DI	02	DI
COM1	03	D1+
	04	D1-
	05	CTS1
	06	RTS1
	07	GND
	08	TxD1
	09	RxD1
	10	INIT*
COM2	11	(Y)D2+
	12	(G)D2-
Power Input	13	(R)+Vs
	14	(B)GND

X505		
Terminal No.		Pin Assignment
COM5	28	RxD5
	27	TxD5
	26	RTS5
	25	CTS5
	24	GND
COM4	23	RxD4
	22	TxD4
	21	RTS4
	20	CTS4
	19	GND
COM3	18	RxD3
	17	TxD3
	16	RTS3
	15	CTS3

Terminal No.		Pin Assignment
COM3	01	CTS3
	02	RTS3
	03	RxD3
	04	TxD3
	05	GND
COM4	06	TxD4
	07	RxD4
DI	08	DI2
	09	INIT*
COM2	10	(Y)D2+
	11	(G)D2-
Power Input	12	(R)+Vs
	13	(B)GND

Pin Assignment		Terminal No.	Pin Assignment
GND	05	09	Data-
N.C.	04	08	RTS
RxD	03	07	CTS
TxD	02	06	N.C.
Data+	01		

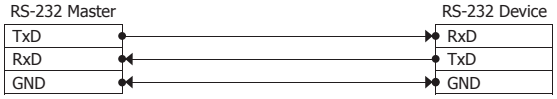
COM1: RS-232
Male DB-9 Connector

Terminal No.		Pin Assignment
DO	01	DO
DI	02	DI
COM1	03	D1+
	04	D1-
	05	CTS1
	06	RTS1
	07	GND
	08	TxD1
	09	RxD1
	10	INIT*
COM2	11	(Y)D2+
	12	(G)D2-
Power Input	13	(R)+Vs
	14	(B)GND

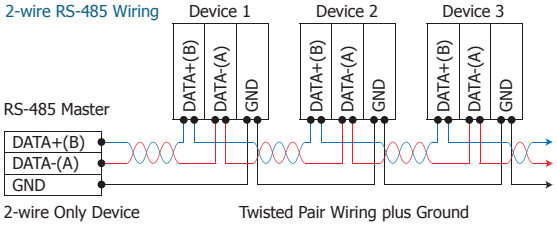
X506		
Terminal No.		Pin Assignment
COM7/8	28	TxD8
	27	RxD8
	26	TxD7
	25	RxD7
	24	GND
COM5/6	23	TxD6
	22	RxD6
	21	TxD5
	20	RxD5
	19	GND
COM3/4	18	TxD4
	17	RxD4
	16	TxD3
	15	RxD3

Wiring

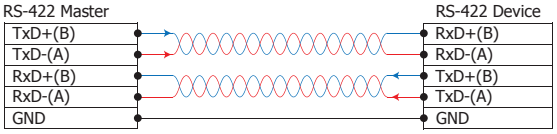
3-wire RS-232 Wiring



2-wire RS-485 Wiring



4-wire RS-422 Wiring

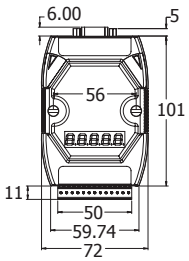


Input Type	DI Value as 0	DI Value as 1
Relay Contact	Relay ON 118 Relay Close DIx GND	Relay Off Relay Open DIx GND
TTL/CMOS Logic	Voltage < 1V Logic Level Low Logic GND DIx GND	Voltage > 3.5V Logic Level High Logic GND DIx GND
Open Collector	Open Collector On On DIx GND	Open Collector Off Off DIx GND

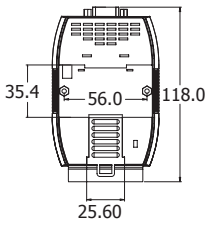
Output Type	DO Command as 1	DO Command as 0
Drive Relay	Relay ON DO.PWR DOx DO.GND	Relay Off DO.PWR DOx DO.GND
Resistance Load	DO.PWR DOx DO.GND	DO.PWR DOx DO.GND

Dimensions (Unit: mm)

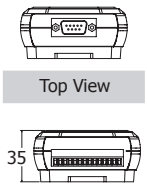
I-7521(D)/I-7522(D)/I-7523(D)



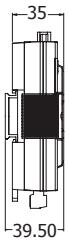
Front View



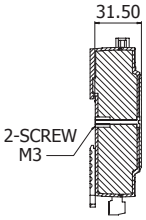
Rear View



Bottom View

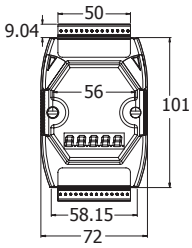


DIN-Rail Mounting Bracket

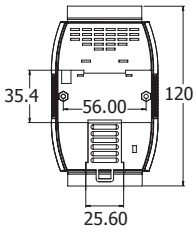


Side View

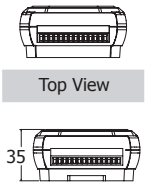
I-7521(D)/I-7522(D)/I-7523(D)



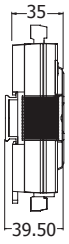
Front View



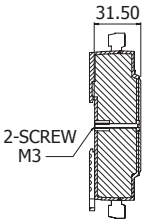
Rear View



Bottom View



DIN-Rail Mounting Bracket



Side View

Ordering Information

I-7521 CR	Programmable Intelligent Communication Controller (RoHS)	I-7523 CR	Programmable Intelligent Communication Controller (RoHS)
I-7521D CR	I-7521 with Display	I-7523D CR	I-7523 with Display
I-7522 CR	Programmable Intelligent Communication Controller (RoHS)	I-7524 CR	Programmable Intelligent Communication Controller (RoHS)
I-7522D CR	I-7522 with Display	I-7524D CR	I-7524 with Display
I-7522A CR	Programmable Intelligent Communication Controller (RoHS)	I-7527 CR	Programmable Intelligent Communication Controller (RoHS)
I-7522AD CR	I-7522A with Display	I-7527D CR	I-7527 with Display

Accessories

MDR-20-24	24 VDC/1 A, 24 W Power Supply with DIN-Rail Mounting	GPSU06U-6	24 VDC/0.25 A, 6 W Power Supply
DIN-KA52F	24 VDC/1.04 A, 25 W Power Supply with DIN-Rail Mounting	KA-52F	24 VDC/1.04 A, 25 W Power Supply