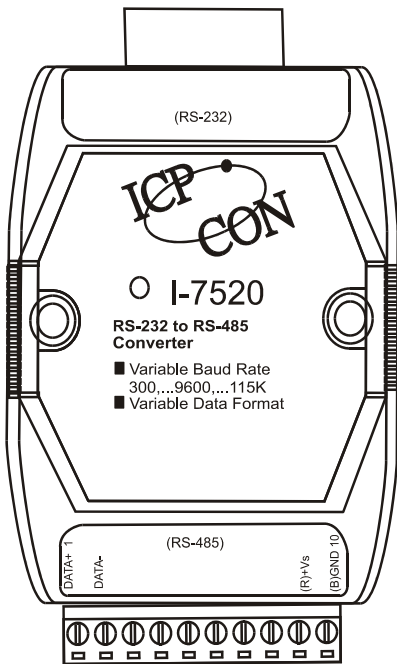


## 2. I-7520/A/R/AR, PCISA-7520AR, PCISA-7520R

### 2.1 I-7520:

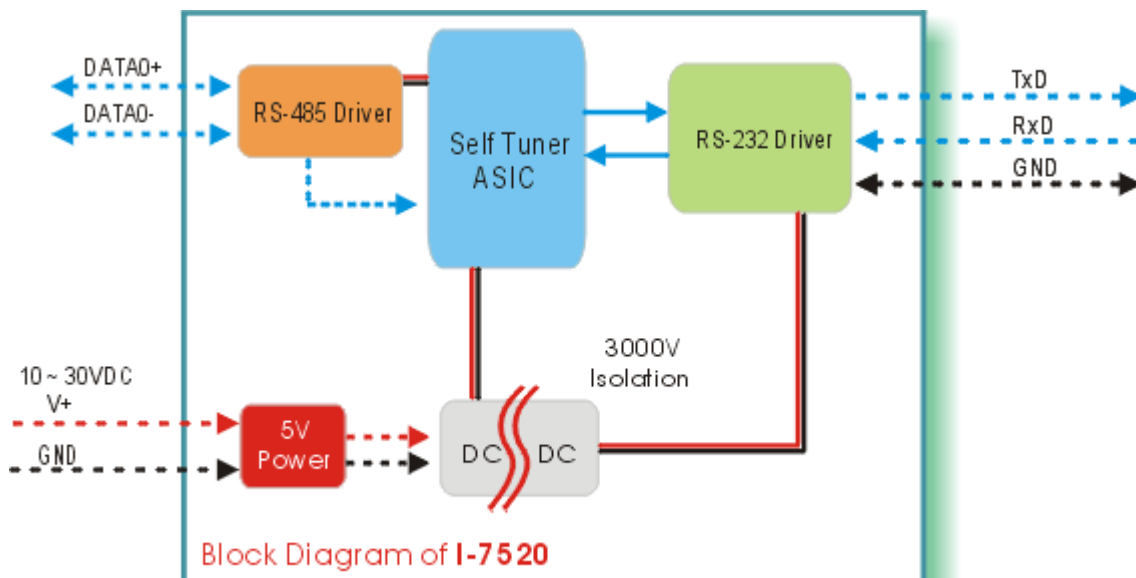
#### 2.1.1 Pin Assignment and Specifications:



#### 7520: RS-232 to RS-485 Converter

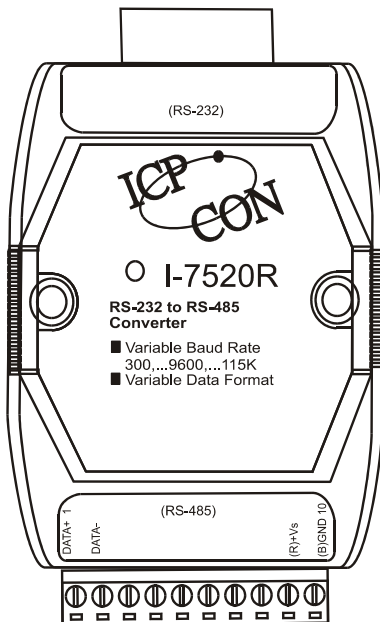
- Protocol: Differential 2-wire half-duplex RS-485
- Connector: plug-in screw terminal block
- Speed: "Self Tuner" inside, auto switching baud rate, from 300 to 115200 bps
- 256 modules max in one RS-485 network without repeater
- 2048 modules max in one RS-485 network with repeater
- Isolation voltage: 3000V
- Isolation site: RS-232
- Repeater request: 4,000 feet or over 256 modules
- Power requirements: +10V dc ~ +30V dc
- Power consumption: 0.05A@24V; Max

### 2.1.2 Block Diagram



## 2.2 I-7520R:

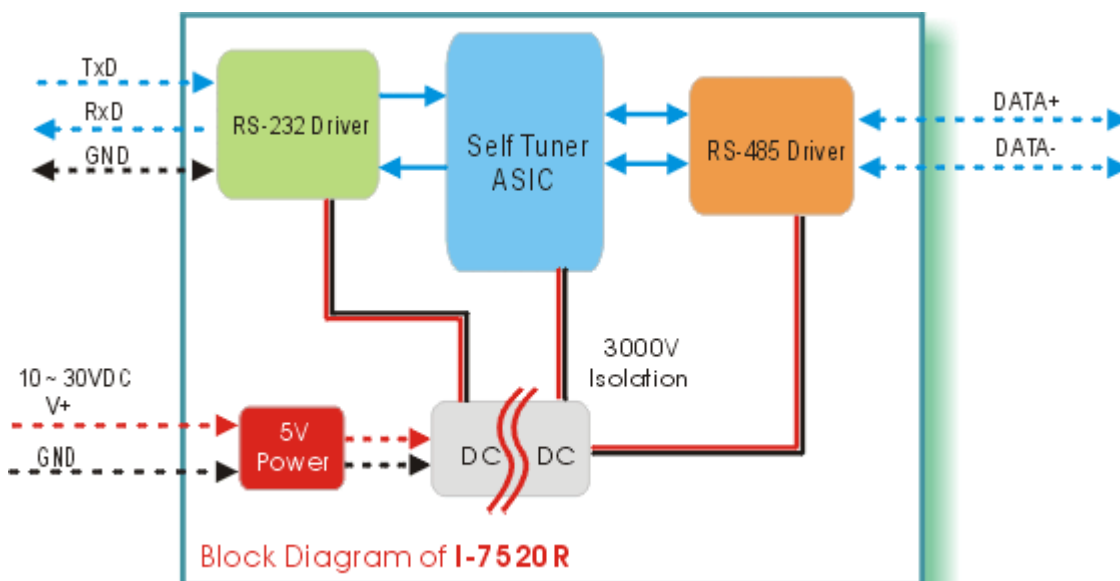
### 2.2.1 Pin Assignment and Specifications:



### 7520R: RS-232 to RS-485 Converter

- Protocol: two-wire RS-485, (D+, D-), protocol
- Connector: plug-in screw terminal block
- Speed: "Self Tuner" inside, auto switching baud rate, from 300 to 115200 BPS
- 256 modules max in one RS-485 network without repeater
- 2048 modules max in one RS-485 network with repeater
- Isolation voltage: 3000V
- **Isolation site: RS-485**
- Repeater request: 4,000 feet or over 256 modules
- Power requirements: +10V dc ~ +30V dc
- Power consumption: 0.05A @24V; Max

### 2.2.2 Block Diagram:



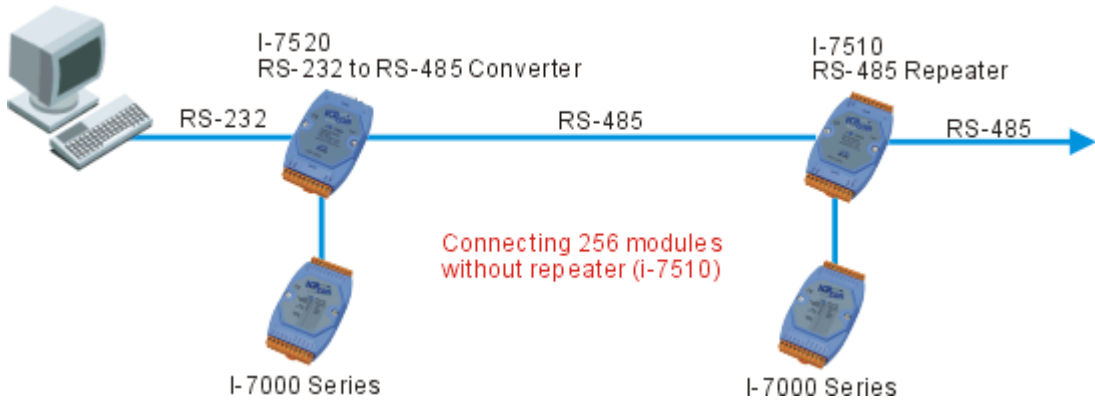
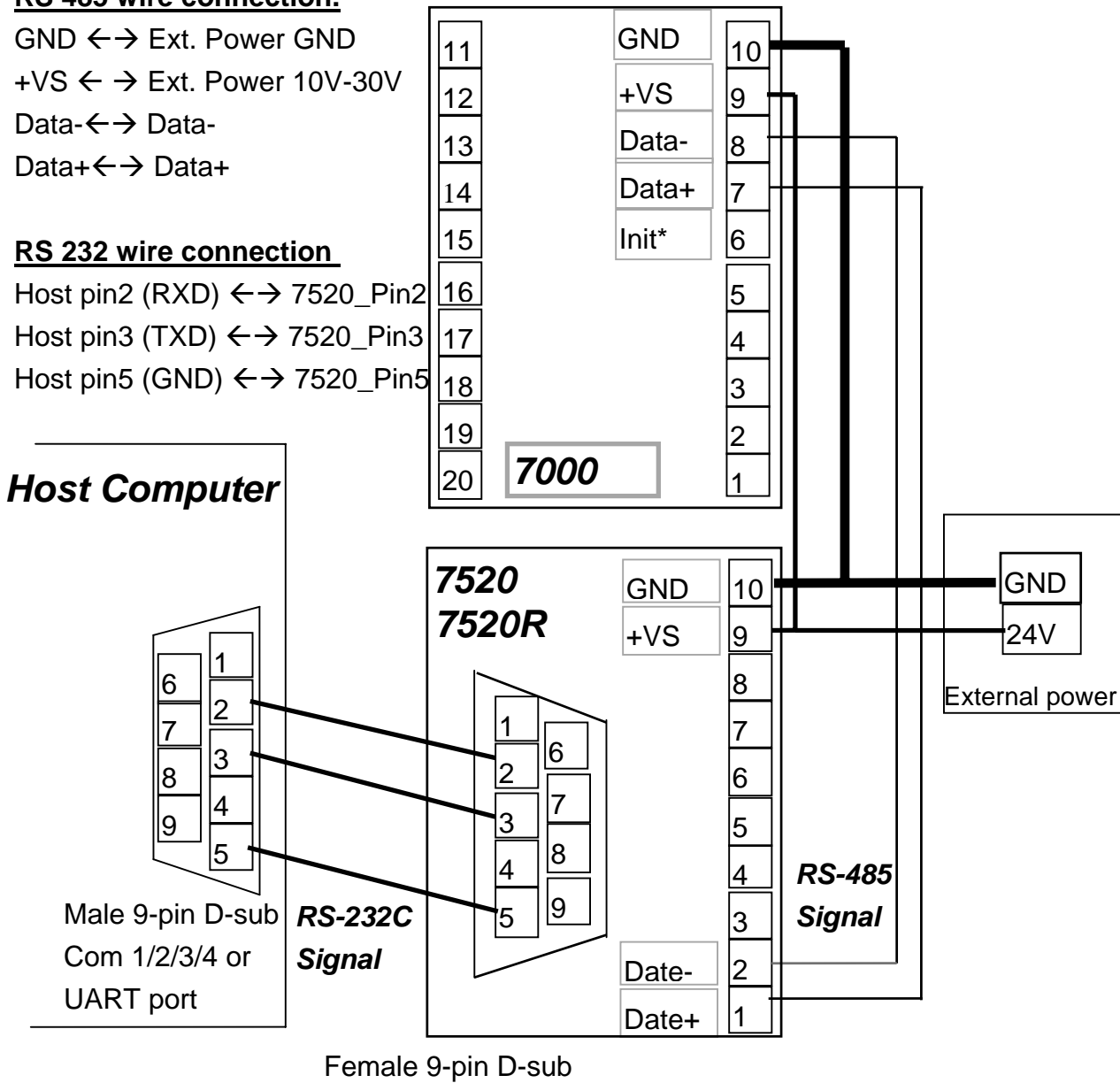
## 2.7 Basic Wire Connection for I-7520:

### RS 485 wire connection.

GND  $\leftrightarrow$  Ext. Power GND  
 +VS  $\leftrightarrow$  Ext. Power 10V-30V  
 Data-  $\leftrightarrow$  Data-  
 Data+  $\leftrightarrow$  Data+

### RS 232 wire connection

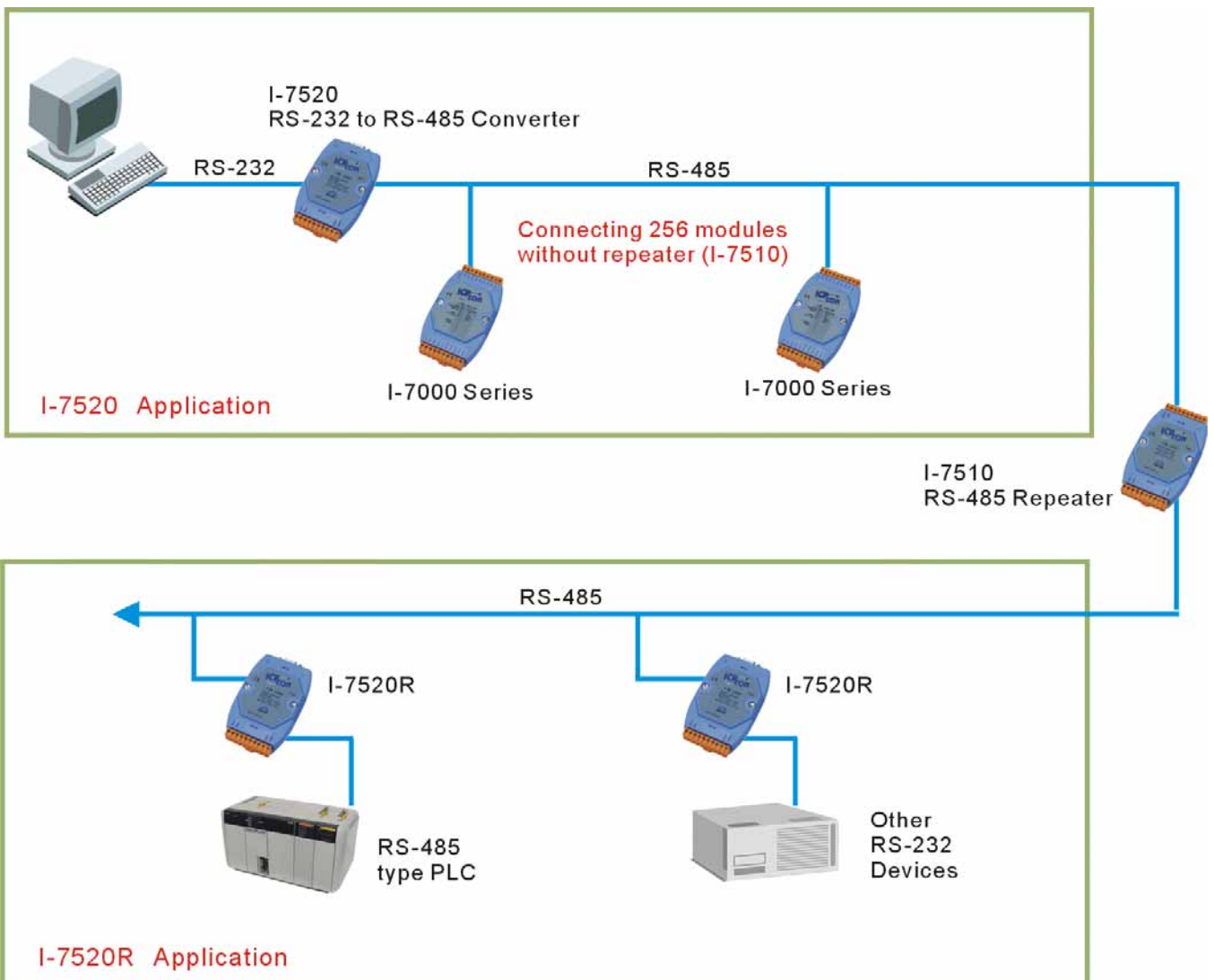
Host pin2 (RXD)  $\leftrightarrow$  7520\_Pin2  
 Host pin3 (TXD)  $\leftrightarrow$  7520\_Pin3  
 Host pin5 (GND)  $\leftrightarrow$  7520\_Pin5

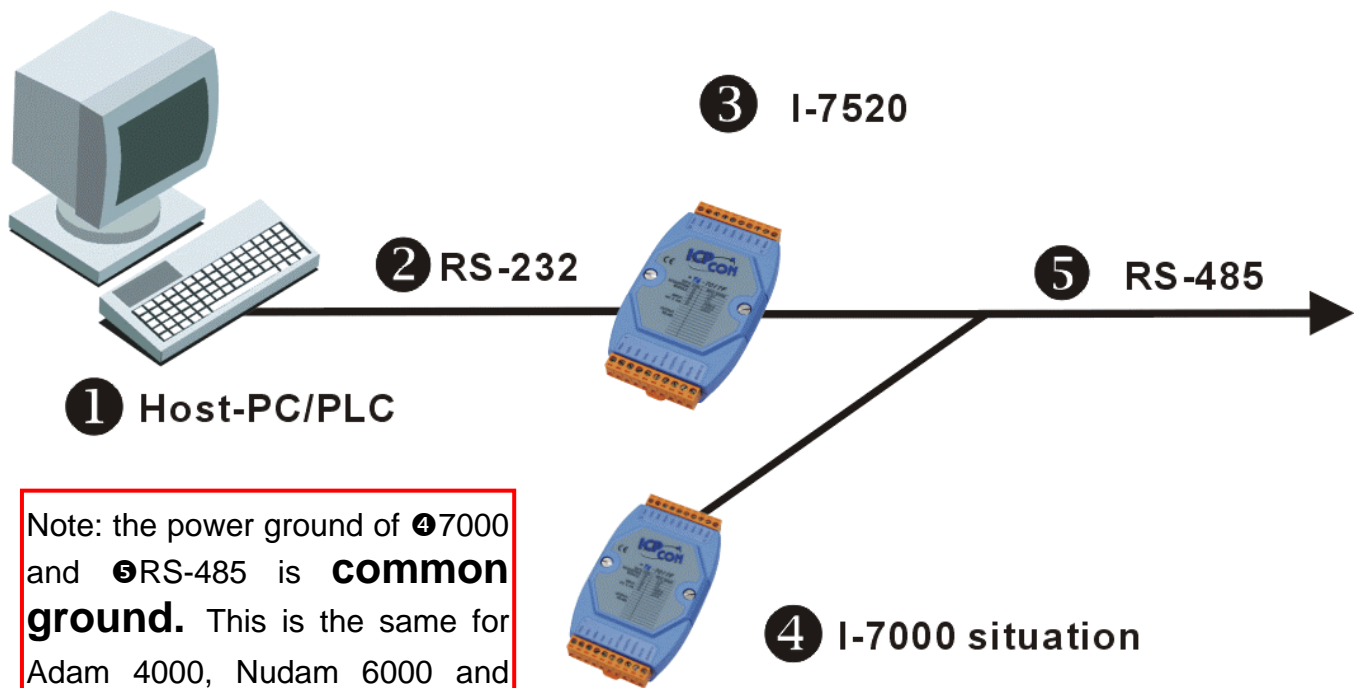


## 2.8 How to select 7520 / 7520R

The 7520R is exactly the same as 7520 except for the isolation site. The isolation site of the 7520 is located in the RS-232 interface circuit, but the isolation site of the 7520R is located in the RS-485 interface circuit. That is to say, the power input and RS-485 interface is common ground for the 7520 but the power input and RS-232 interface is only common ground for the 7520R as follows:

	7520	7520R
RS-485 site	Common ground	Isolation site
Power ground		Common ground
RS-232 site	Isolation site	
Applications	Most applications.	For RS-232 type PLC networking





Note: the power ground of ④7000 and ⑤RS-485 is **common ground**. This is the same for Adam 4000, Nudam 6000 and DATAFORTH 9B series modules.

In most applications, the ③7520 are used to convert the ②RS-232 signal to ⑤RS-485 network. Normally the ③7520 does not use the same DC power ground as the ①Host PC/PLC, and the isolation site is in the RS-232 section. Therefore the ①Host PC/PLC is isolated from ⑤RS-485 network. That is to say, if there is any high voltage transient on ⑤RS-485 network, the ①Host PC/PLC will be free from damage.

**WARNING!! ERROR CONDITION 1:** if the ③7520 are replaced by ③7520R and the ③7520R uses the same DC power ground with ④7000. In this situation,

- (1) The ①Host PC/PLC is common ground with ②RS-232
- (2) The ②RS-232 is common ground with power ground of ③7520R
- (3) The power ground of ③7520R is common ground with power ground of ④7000
- (4) The power ground of ④7000 is common ground with ⑤RS-485

Therefore the ①Host PC/PLC is common ground with ⑤RS-485 network. That is to say, there is no isolation between ①Host PC/PLC and ⑤RS-485 network. The ①Host PC/PLC may be damaged if there is high voltage transient on ⑤RS-485 network.

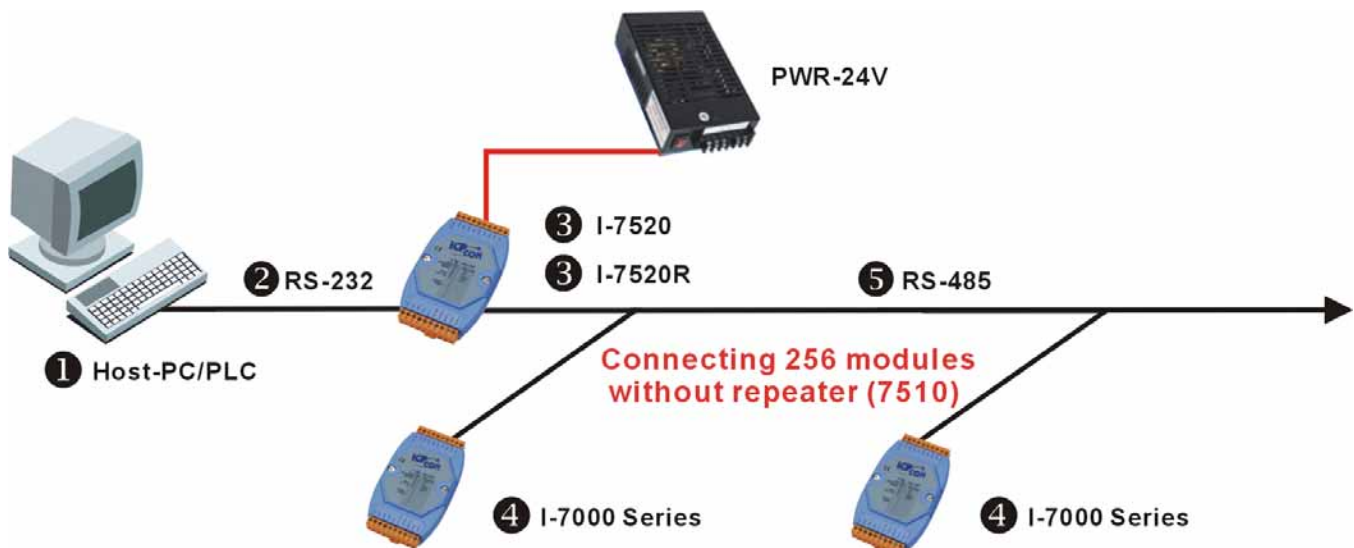
**WARNING!! ERROR CONDITION 2:** if the ③7520 uses the same DC power ground with ①Host PC/PLC (for example, ①Host PC/PLC provide non-isolated DC power source to ③7520). In this situation,

- (1) The ①Host PC/PLC is common ground with power ground of ③7520
- (2) The power ground of ③7520 is common ground with ⑤RS-485

Therefore the ①Host PC/PLC is common ground with ⑤RS-485 network. That is to say, there is no isolation between ①Host PC/PLC and ⑤RS-485 network. So the ①Host PC/PLC may be damaged if there is high voltage transient on ⑤RS-485 network.

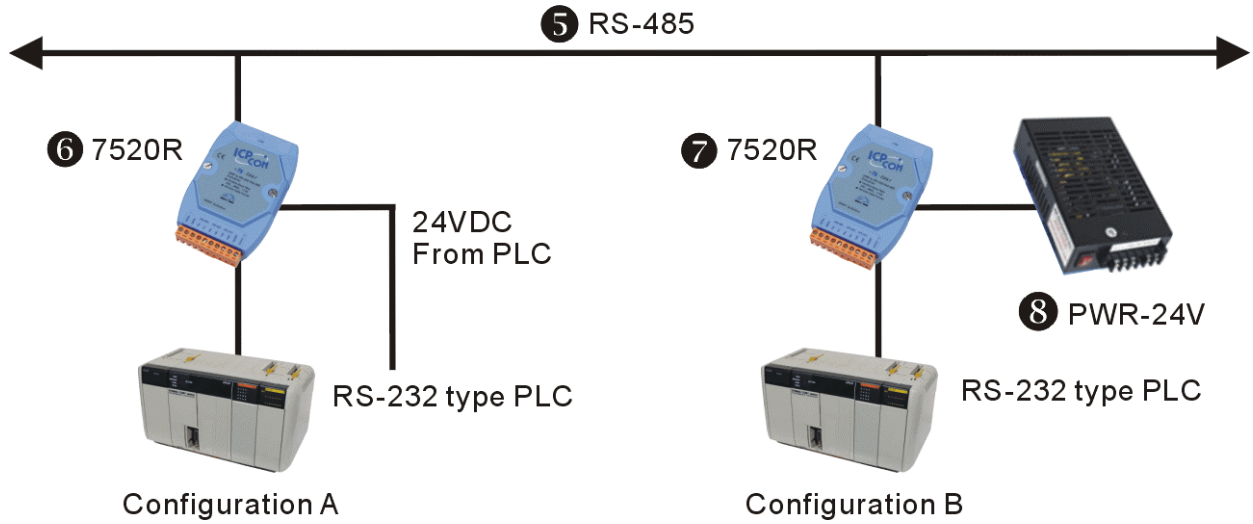
**OK CONDITION:** If the DC power ground of ③7520 or ③7520R is not common to any module, the ①Host PC/PLC will be isolated from ⑤RS-485 network in all conditions.

The power adapter PWR-24 is designed for single 7000 series modules only. The 24V DC output of the PWR-24 is isolated from its AC input. If the ③7520 or ③7520R is connected to the PWR-24, this PWR-24 cannot connect to the other module. Normally the ①Host PC/PLC uses a switching power and the DC output of this power supply is also isolated from its AC input. Therefore the DC power ground of ③7520 or ③7520R is isolated from ①Host PC/PLC. Therefore, the ①Host PC/PLC is isolated from ⑤RS-485 network in all condition.



①Host PC/PLC is isolated from ⑤RS-485 network for ③7520 or ③7520R in all condition

The 7520R is designed for PLC networking. During normal conditions, the PLC system will have a stable DC-24V power source. The user may use this power source to ⑥7520R(configuration A). When using ⑦7520, the user must use another power source, ⑧PWR-24 (configuration B).



The isolation feature is very important in real world applications, therefore the user should pay attention when selecting the correct module. If the wrong module is selected, the isolation will be removed but the module will still function OK. This may cause unexpected damaged by high-energy transients on an RS-485 network.