

# 2100-A16 Connections

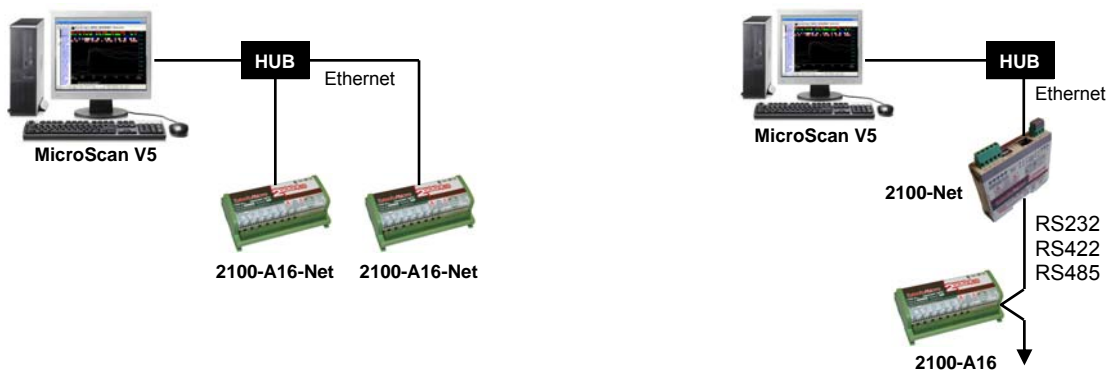
**Flexible connections options include:**  
RS232, RS422, RS485, Ethernet, Radio Link.

**Protocols:**  
MicroScan, MODBUS RTU, MODBUS TCP

## Ethernet:

Ethernet Cabling (Category 5e or 6) cable is required for 100mbs fast Ethernet transmission.

The Ethernet converter on the 2100-A16-NET, the XPort, uses the Ethernet Protocol (IP) for network communications and the Transmission Control Protocol (TCP) to assure that no data is lost or duplicated, and that everything sent to the connection arrives at the correct target.



**Ethernet:**

- Interface RJ45 10Base-T & 100Base-TX Autosensing.
- Compatibility Version 2-0/IEEE802.3
- LEDs 10Base-T & 100Base-TX Activity; Full/Half Duplex.

## Tel Link:

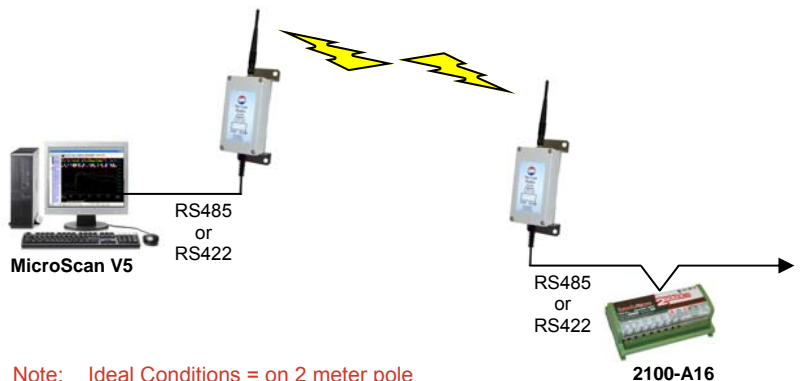
The **Tel-Link Radio Modems** are powered by FCC and ETSI approved MaxStream radio modules with frequency hopping spread spectrum capability.

Radio Modems operate in the 2.4GHz license-free ISM bands (Industrial, Scientific and Medical bands). The Tel-Link modules are certified for use in USA, Canada, Europe, New Zealand and Australia.

Up to 15km Range (*ideal conditions line of sight*) can be achieved with a High Gain Antenna. The Tel-Link modules are connected to the PC through RS485/422 interface.

### Performance Outdoor Ideal Conditions:

With Supplied Antenna	- up to 1.5km.
With TL-OD24-8 Monopole	- up to 5km.
With TL-PG24-15 Parabolic Grid	- up to 10km.



**Note:** Ideal Conditions = on 2 meter pole with line of sight and no surrounding trees and buildings.

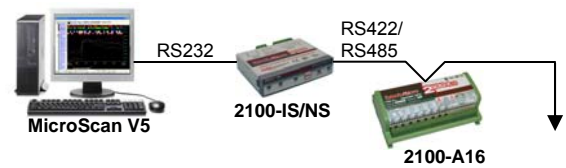
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## RS422/485:

Typically up to 1200m.

RS422/485 Comms Signal Cabling:

- (1) Use only low capacitance, twisted pair, overall screened data cable. The cable must equal or better the following specifications.



Cable Specifications		
Conductor Size		7/0.20mm, 24AWG
Conductor Resistance @ 20°C		8.9Ω/100m
Max. Working Voltage		300Vrms
Capacitance Between Wires of a Pair		50pF/m
Capacitance Between Each Wire to All Others Bunched Together		95pF/m
Cross-talk Between Pairs:	@ 1kHz @ 100kHz	>-90dB/100m >-50dB/100m
Characteristic Impedance	@ 100kHz	135Ω
Attenuation of a Pair:	@ 1kHz @ 10kHz @ 100kHz @ 50kHz @ 1MHz @ 1.5MHz	0.15dB/100m 0.42dB/100m 0.8dB/100m 0.9dB/100m 1.9dB/100m 2.4dB/100m

NOTE: All cables are to be subject during manufacture to in-process spark testing @ 4kVrms. All cables are to be tested between conductors and conductors to screen for 1min @ 1500Vrms.

- (2) Minimum cable pairs: RS422 = 2. (Plus overall screen.) RS485 = 1. (Plus overall screen.)  
 (3) Take care not to stress or damage cables during installation.  
 (4) Total length of trunk line, including spurs, is not to exceed 1200m without isolating boosters.  
 (5) Terminating resistors -1kΩ.  
 (6) Cabling paths should avoid sources of radio frequency interferences such as fluorescent lights, variable speed motor drives, welding equipment, radio transmitters, etc.  
 (7) There should be a minimum of 200mm physical separation between power cables and data cables.  
 (8) Data cables should not be exposed to excessive heat or moisture, and should not be buried directly in the ground without protection.  
 (9) Avoid powering a remote station or controller from the same power supply as a variable speed drive.  
 (10) All unused twisted pairs should be terminated at both ends with 1kΩ resistors. DO NOT ground unused pairs.

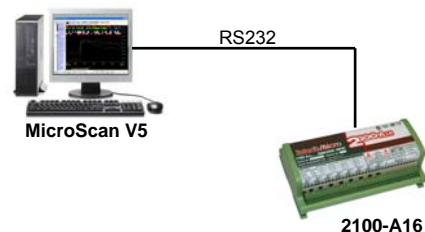
## RS232:

Typically up to 15m (Supplied with 5m cable)

The 2100-A16 with RS232 comes complete with:

- 1x5m RJ11 RS232 Cable. (2, 10 & 15m available.)  
 1x9 Pin D-type Connector. (25 pin D-type available.)

\*USB to RS232 convertor available. Part No. BF-801.  
 \*Optional Extra.



## PLC:

Using the 2100-A16 to expand the PLC analogue inputs. 2100-A16 features universal analogue inputs, configurable for most signal types.

### Two options for PLC/2100-A16 hookup:

- Clock & Reset.
  - The PLC pulses digital outputs to reset/clock the 2100-A16 channels.
  - An analogue output from the 2100-A16 returns the channel level to the PLC.
- RS232, RS422, RS485, MODBUS RTU.

