# 2100-A16 Connections

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

Protocols:
MicroScan, MODBUS RTU, MODBUS TCP

Ethernet:

Ethernet Cabling Category 5 (Cat 5) or better (eg: Cat 5e or Cat 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.
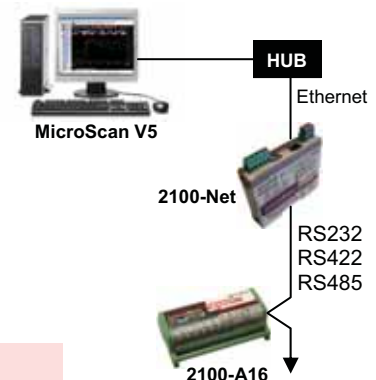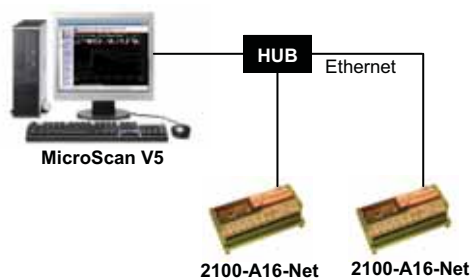
Ethernet:	- Interface	RJ45 10Base-T & 100Base-TX Autosensing.
	- Compatability	Version 2-0/IEEE802.3
	- LEDs	10Base-T & 100Base-TX Activity; Full/Half Duplex.

- -

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 are available for either the 2.4GHz or 900MHz license-free ISM bands (Industrial, Scientific and Medical bands). Up to 30km Range* (Line of Sight) can be achieved on 900MHz with a High Gain Antenna.

There is a full range of RS232, RS485 and RS422 interface options available allowing incredible flexibility.
- 900MHz modules certified for use in USA, Canada, New Zealand and Australia.
- 2.4GHz modules certified for use in USA, Canada, Europe, New Zealand and Australia.
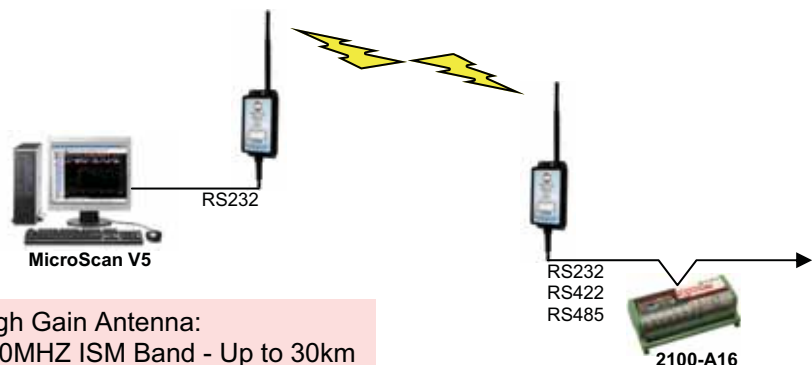
Performance:
- Indoor Urban;
900MHz Band - Up to 450m
2.4GHz ISM Band - Up to 180m

Outdoor Line Of Sight:
Ideal* Conditions:
- with Dipole:
900MHZ ISM Band — Up to 10km
2.4GHz ISM Band— Up to 5km

High Gain Antenna:
900MHZ ISM Band - Up to 30km
2.4GHz ISM Band - Up to 15km

Normal* Conditions:
- with Dipole:
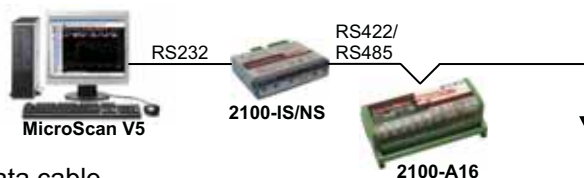900MHZ ISM Band— Up to 3km.
4GHz ISM Band — Up to 1.5km

High Gain Antenna:
900MHZ ISM Band - Up to 6km
2.4GHz ISM Band - Up to 3km

Note * Ideal Conditions = Hill top to Hill top.
Normal Conditions = on 3 meter pole with line of sight and no surrounding trees and buildings.

>> **www.intech.co.nz**

Intech INSTRUMENTS LTD

2100-A16 Connections

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 @ 20C.		8.9Ω/100m
Max. Working Voltage.		300Vrms
Capacitance between wires of a pair.		50ρF/m
Capacitance between each wire to all others bunched together.		95ρF/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.
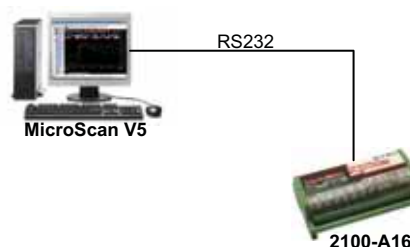(10)   All unused twisted pairs should be terminated at both ends with 1kΩ resistors. DO NOT ground unused pairs.

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:
1. 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.
2. RS232, RS422, RS485, MODBUS RTU.