

Application note on SCADA / Process Automation system

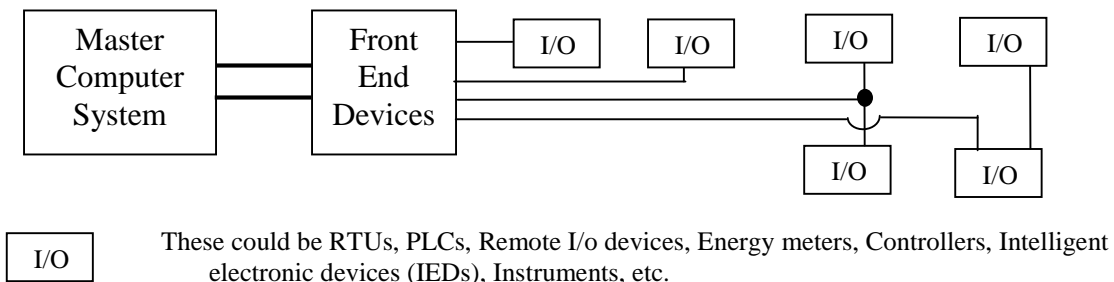
Supervisory Control And Data Acquisition (SCADA) systems are typically used by utilities such as power, Oil & Gas, water and waste management, etc. SCADA systems are also used by Process Industries including petrochemicals, fertilizers, cement, paper and pulp, steel industries, and aluminum plants.

Many installations of these systems are in areas where it is exposed to harsh environments of EMI, RFI, multiple/dirty ground, and lightning where in the conventional communication cables have to be protected to run SCADA properly. Apart from this, distances to be covered may involve additional devices such as repeaters, boosters, or line drivers. This puts pressure on the proper installation methods used and supervision of extra testing to make sure that it will not surprise in future or require corrective action when problems develop. Fiber optic communication provides a clean and safer solution in this case. With a fiber optic system, SCADA systems can be set up without repeaters and can cover a much larger geographical area.

Major advantages of fiber optic systems

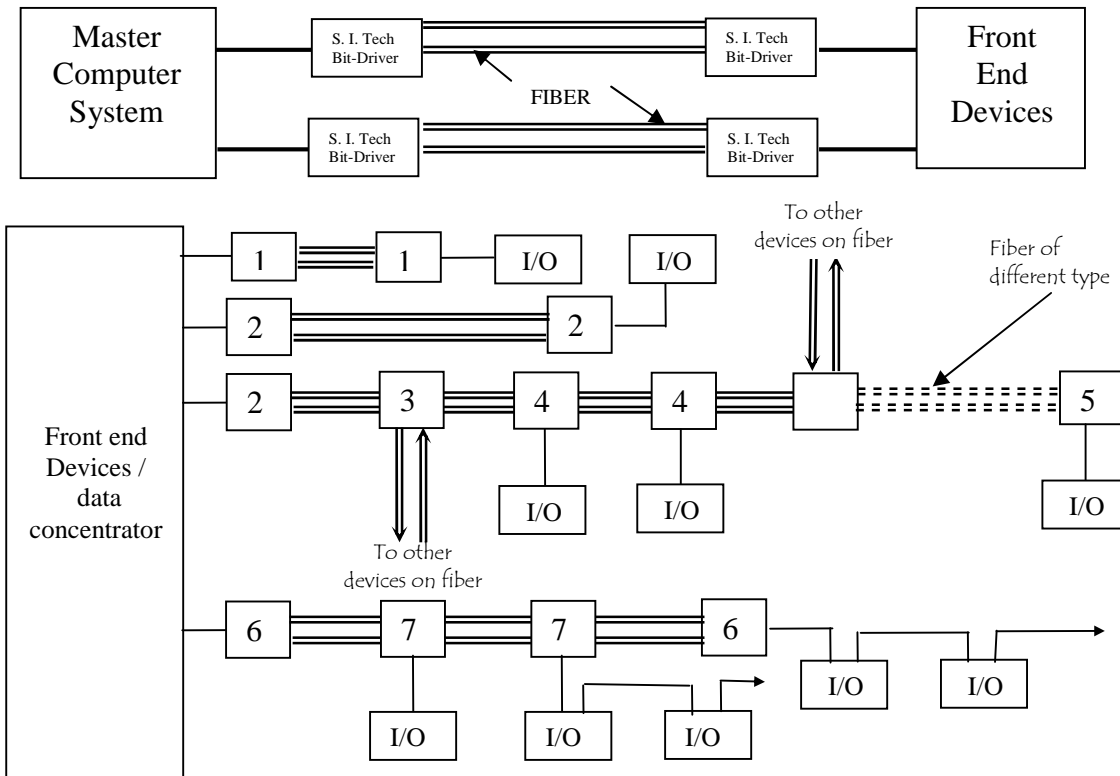
- Electrical isolation – No electrical, magnetic, or radio frequency interference
- No grounding or cables can be installed next to power lines
- Covers longer distances which otherwise not feasible or difficult on metallic cables
- Clean and safe media
- Future proof installation for high speed communication

Typical system set up



Here the two-tier communication is envisioned. Between master and front end is generally at a higher speed where as the I/Os are at a lower speed. The I/Os are connected in various configurations such as individual, star connected (broad cast), or multidrop.

S. I. Tech products can be used as follows:



S. I. Tech products for point-to-point communication could be:

- RS 232 – 2005 / 2505 / 2507 / 2560
- RS 422 – 2106 / 2012 / 2561
- RS 232 – 2139
- RS 232 – 2109
- RS 232 – 2505-660
- RS 485 – 2110 / 2126 / 2562
- RS 485 – 2128 / 2228

If it is based on the network topology then:

Ethernet

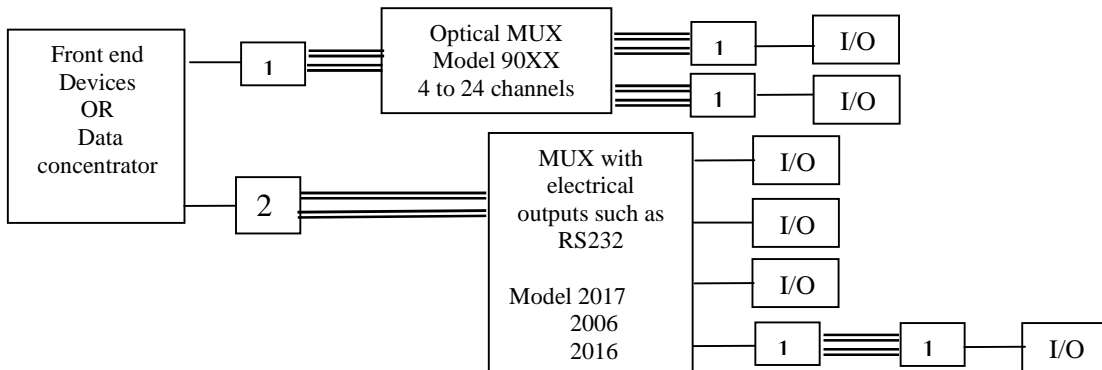
- 10 Mbps - 2550
- 10/100 Mbps - 2150 – 10/100A
- Gigabyte - 2160

Industrial Ethernet

- 10/100 Mbps - 2151

The above diagram shows how individual connectivity of multidrop is possible either on fiber or in combination of copper and fiber. Also combination of different fiber types such as multimode, single mode, or plastic fiber is possible to cover different distances like in a wide industrial complex, electrical distribution network, etc. where devices or locations are spread over long distances and needs connectivity end to end.

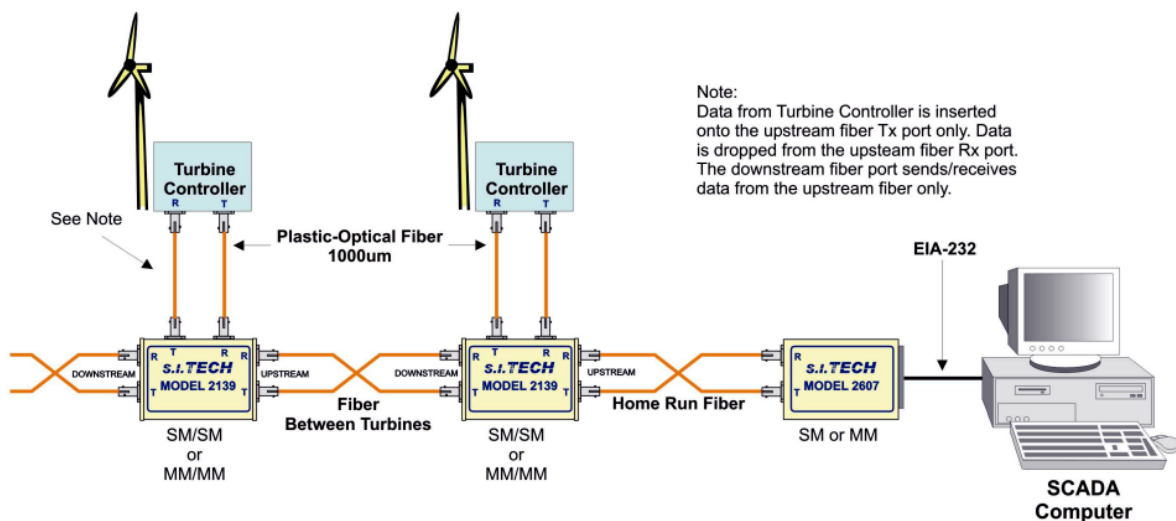
This diagram indicates how devices can be multiplexed and brought to a common device with a single pair of fiber.



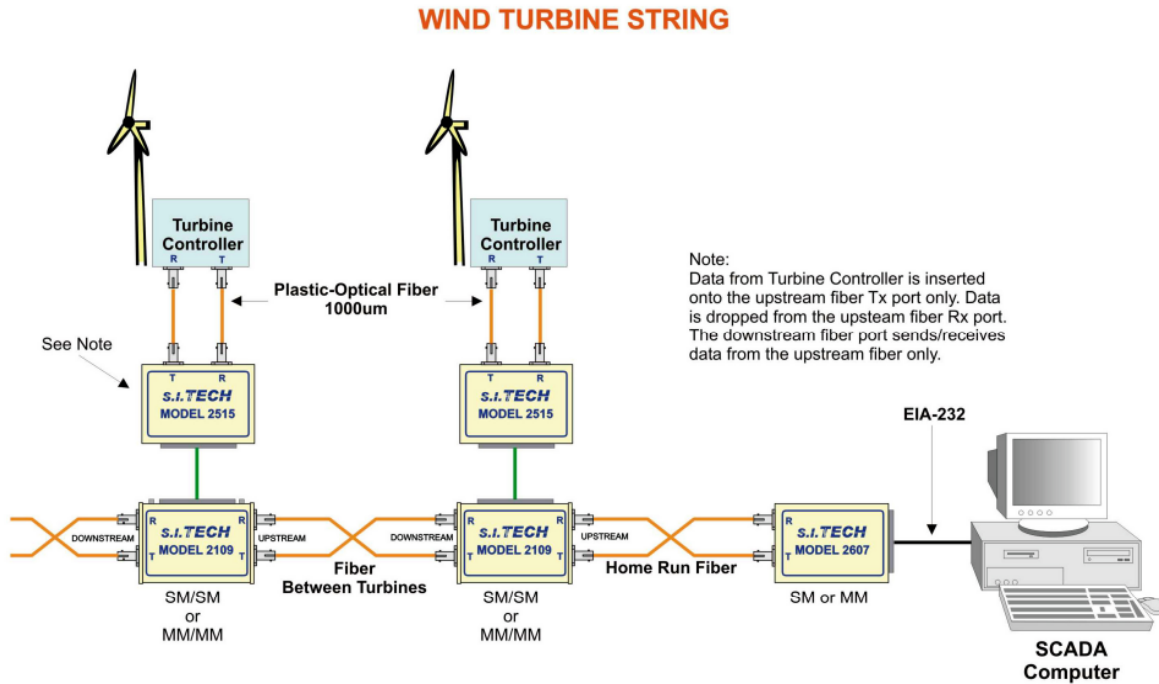
Fiber multidrop connectivity examples of windmill application:

Example 1:

WIND TURBINE STRING



Example 2:



These configurations are used in many applications by our various valuable customers for over a long period with satisfactory performance. The product range provides flexibility in engineering as per the other SCADA system components and user requirements.

Further information can be obtained by contacting S.I. Tech at:

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