# 1. Module Description

The AL-2301 is the physical medium used for the transmission of data over the ALNET II network. It consists of a shielded cable with two twisted pairs, containing the necessary features for high-speed transmission in an industrial environment.

# 2. Functional Features

## 2.1. General Features

- Conductor:
  Flexible copper wire of 18 AWG, formed by 7 filaments with 0.40-mm nominal diameter
- Shielding:
  metalized polyester film helicoidally applied over the pair.
- External cover:
  black, non-flammable PVC
- Identification of the pairs:
  - pair # 1: white and blue conductor
  - pair # 2: red and green conductor

## 2.2. Electrical Features

- Minimum insulation resistance between each conductor at 20°C:
  5,000 MΩ/km
- Propagation speed:
  80%
- Voltage test:
  - between conductors: 500 Vdc/3 s
  - between conductors and shielded cable: 500 Vdc/3 s
- Characteristic impedance (1 kHz):
  120 Ω
- Mutual capacitance:
  39.0 pF/m
- Maximum attenuation at 1 MHz:
  1.5 dB/100 m
- Maximum resistance at 20°C:
  20 Ω/km
- Rising time (10 to 90%) in 1 km:
  900 ns
- Diaphonics:
  Square wave signal, with rising time of 10 ns and amplitude of 5 Vdc from peak to peak, applied in a differential manner upon one of the pairs, it should not cause interference higher than 50 m V on the other pair, in a 2 km range with both pairs with 120 Ω resistors at their ends.