# ETHERNET MANAGED SWITCH, TYPE 1

Updated: 11/02/2023

Description

This work shall include all materials and work necessary to install an Ethernet Managed Switch, Type 1 in a traffic signal cabinet. The Ethernet Managed Switch, Type 1 will connect the equipment in the field cabinet to the Kane County ITS data-comm fiber optic network.

Materials

The Ethernet Managed Switch, Type 1 is a managed edge switch configured with a minimum of the following ports:

12 RJ-45 10/100 Communication ports;

4 Single-Mode 1000 base fiber optic communication ports through utilization of modular SFP slots

The Ethernet Managed Switch, Type 1 shall satisfy the following:

Power Consumption: 25 W (maximum, without PoE)

Temperature Range -40 to +165 degrees F; (-40 to +75 degrees Celsius)

cooling shall use convection and heat sinking; no fans

Performance:

Filtering / Forwarding Rate: Ethernet (10Mb): 14,880 pps

Fast Ethernet (100Mb): 148,800 pps

Gigabit Ethernet (1000Mb): 1,488,000 pps

Switching Processing: Store and Forward with IEEE 802.3x full dupleflow -control, non-blocking

Data Rate: 10Mbps, 100Mbps and 1000Mbps

Address Table Capacity: 4K node, self-learning with address aging

Packet buffer size : 240KB for 10/100 and 120KB for 1000Mb

Latency: 5 μs + packet time (100 to 100Mbps)

15 μs + packet time (10 to 10 Mbps, and 10 to 100Mbps)

Throughput with max.- 4.17M pps (Transmit)

(8 10/100linls and 2Glinks)

Back plane- 2.66Gb/s per slot

Network Standards and Compliance, hardware

Ethernet V1.0/V2.0 IEEE 802.3: 10BASE-T,

IEEE 802.3u: 100Base-TX, 100BASE-FX

IEEE 802.3z: 1000BASE-X Ethernet (Auto-negotiation)

IEEE 802.3ab: 1000BASE-X Ethernet

IEEE 802.1p: Priority protocol

IEEE 802.1d: Spanning tree protocol

IEEE 802.1w: Rapid Spanning tree protocol

IEEE 802.1q: VLAN Tagging

IEEE 802.3x: Flow Control

IEEE 802.3ad: Link Aggregation (Trunking)

IEEE 802.1x: Port based Network access control

Compatibility

The switch must be functionally interchangeable with the legacy Garrettcom 6KQE Ethernet switch. If requested by the Engineer, the Contractor shall provide an off-the-shelf factory model of the proposed switch and demonstrate that the proposed switch will operate transparently and with full functionality in the existing ITS data-comm network. The demonstration will take place prior to ordering any data-comm equipment.

Construction

The Contractor shall locate shelf space or other suitable mounting location in the traffic signal cabinets or as identified on the plans. The Contractor shall secure the Ethernet Switch as appropriate and approved by the engineer.

The Contractor shall install all necessary patch cords, optical transceivers, connectors, power supplies, communication transformers, or auxiliary equipment necessary to complete the communication circuits at full functional potential. The Contractor shall connect the switch to the field devices as indicated on the plans.

When requested by the Contractor, the Engineer will provide the necessary IP address assignments and port assignments, including the necessary port provisioning. The contractor shall be responsible for all network programming of the network switches and communicating elements within the traffic signal cabinet.

The Contractor will demonstrate that the switches are correctly installed and configured as specified in other special provisions for this project.

Basis of Payment

This work shall be paid for at the contract unit price each for ETHERNET MANAGED SWITCH, TYPE 1, which price shall be payment in full for furnishing and installing an Ethernet Managed Switch as specified.