



Write an IEC 61131 based function block in ST to get Ethernet PowerLink diagnostic information of a control node device from a controller ( Powerlink managing node).



Here's an example IEC 61131 function block in Structured Text (ST) that retrieves Ethernet PowerLink diagnostic information from a control node device:



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```
FUNCTION_BLOCK GET_POWERLINK_DIAGNOSTIC_INFO
VAR_INPUT
    NodeID : UINT; // ID of the control node device
END_VAR
VAR_OUTPUT
    Status : INT; // Status of the diagnostic information retrieval
    Data : ARRAY[0..255] OF BYTE; // Diagnostic information data
END_VAR
VAR
    Request : ARRAY[0..7] OF BYTE := [16#02, 16#00, 16#00, 16#00, 16#00, 16#00, 16#00, 16#00];
    Response : ARRAY[0..255] OF BYTE; // Response message containing diagnostic information
    Connection : ETHERNET_POWERLINK_CONNECTION; // Connection object for Ethernet PowerLink
    ErrorCode : WORD; // Error code returned by the connection object
    RequestSuccess : BOOL; // Flag indicating whether the request message was successfully sent
    ResponseSuccess : BOOL; // Flag indicating whether the response message was successfully received
    i : INT; // Loop counter
END_VAR

// Initialize the connection object with the managing node IP address and port number
Connection.Init("192.168.0.1", 0x88AB);

// Send the request message to retrieve the diagnostic information
Request[2] := NodeID;
RequestSuccess := Connection.Send(Request, SIZEOF(Request), ErrorCode);

// Check if the request message was successfully sent
IF RequestSuccess THEN
    // Receive the response message containing the diagnostic information
    ResponseSuccess := Connection.Receive(Response, SIZEOF(Response), ErrorCode);

    // Check if the response message was successfully received
    IF ResponseSuccess THEN
        // Extract the diagnostic information data from the response message
        FOR i := 0 TO 255 DO
            Data[i] := Response[16+i];
        END_FOR

        // Set the status to indicate success
        Status := 0;
    ELSE
        // Set the status to indicate error
        Status := -1;
    END_IF
ELSE
    // Set the status to indicate error
    Status := -1;
END_IF

// Close the connection object
Connection.Close();
```

The function block takes an input parameter `NodeID` that specifies the ID of the control node device whose diagnostic information is to be retrieved. The output parameter `Status` indicates the status of the diagnostic information retrieval, with a value of 0 indicating success and -1 indicating error. The output parameter `Data` is an array of bytes that contains the retrieved diagnostic information.

The function block uses an Ethernet PowerLink connection object to communicate with the managing node, which is assumed to have an IP address of "192.168.0.1" and a port number of 0x88AB. The function block sends a request message to retrieve the diagnostic information, which is a standard Ethernet PowerLink message with a node ID field set to `NodeID`. The function block then waits for a response message containing the diagnostic information, extracts the data from the response message, and sets the output parameters accordingly.

Note that this is just an example implementation, and the specific details of the Ethernet PowerLink diagnostic information retrieval process may vary depending on the specific implementation and version of the protocol being used.