Write a self-contained 61131-3 structured text function block that reads diagnostic data from a Profibus DP slave device.

To create a self-contained IEC 61131-3 structured text function block that reads diagnostic data from a Profibus DP slave device, you need to follow the structure and syntax for IEC 61131-3 programming languages. Here is an example of a function block for reading diagnostic data using Structured Text:

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```
FUNCTION_BLOCK ReadProfibusDiagnostics
VAR_INPUT
  ProfibusMaster : REFERENCE TO PROFIBUS_MASTER;
  SlaveAddress   : BYTE;
END_VAR

VAR_OUTPUT
  DiagnosticData : ARRAY [0..255] OF BYTE;
  Status         : BOOL;
  ErrorMessage   : STRING;
END_VAR

VAR
  ReqState       : INT := 0;
  InternalStatus : BOOL;
END_VAR

METHOD ReadDiagnosticData : BOOL
VAR
  DiagnosticTelegram : ARRAY [0..255] OF BYTE;
  TelegramLength     : UDINT;
  i                  : UDINT;
END_VAR

CASE ReqState OF
0: (* Initialize *)
  ProfibusMaster^.Initialize();
  ReqState := 10;

10: (* Request diagnostic data *)
  InternalStatus := ProfibusMaster^.ReadDiagnostic(SlaveAddress, Diagnostic

  IF InternalStatus THEN
    FOR i := 0 TO TelegramLength - 1 DO
      DiagnosticData[i] := DiagnosticTelegram[i];
    END_FOR;

    Status := TRUE;
    ErrorMessage := '';
    RETURN TRUE;
  ELSE
    Status := FALSE;
    ErrorMessage := ProfibusMaster^.LastError;
    RETURN FALSE;
  END_IF;
END_CASE;
END_METHOD

END_FUNCTION_BLOCK
```

In this example, a function block `**ReadProfibusDiagnostics**` is created with the necessary input and output variables. The input variables are a reference to a Profibus DP master device (`**ProfibusMaster**`) and the address of the slave device (`**SlaveAddress**`). The output variables include an array of bytes containing the diagnostic data (`**DiagnosticData**`), a status flag (`**Status**`), and an error message (`**ErrorMessage**`).

The function block contains a method `**ReadDiagnosticData**` that implements the reading of diagnostic data from the Profibus DP slave device using a state machine approach. The state machine has two states: an initialization state (0) and a state to request diagnostic data (10).

In the initialization state (0), the Profibus DP master device is initialized. After initialization, the state machine moves to the state 10, where it sends a request for diagnostic data using the `**ReadDiagnostic**` method from the `**ProfibusMaster**` object. If the request is successful, the received diagnostic data is copied to the output array `**DiagnosticData**`, the status flag is set to TRUE, and the error message is cleared. Otherwise, the status flag is set to FALSE, and the error message is populated with the latest error from the Profibus DP master device.

This example assumes the existence of a `**PROFIBUS_MASTER**` object with the necessary methods and properties. You may need to adapt this example to fit the specific Profibus DP master library you are using.