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# SST Profibus Scanner Module

## DLL Reference Guide

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**This document applies to the SST Profibus Scanner Module**.



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Hardcopies are not controlled.

# Contents

# Preface

## Preface Sections:

- Purpose of this Guide
- Conventions

# Purpose of this Guide

This document is a reference guide for the Profibus Scanner Module firmware (PFBSCAN), an application module for the SST-PFB3 family of interface cards. For firmware-related information, refer to The SST Profibus Scanner Module Firmware Reference Guide.

# Conventions

This guide uses stylistic conventions, special terms and special notation to help enhance your understanding.

## Style

The following stylistic conventions are used throughout this guide:

| | |
|---|---|
| **Bold** | indicates field names, button names, tab names, executable files, and options or selections |
| Underlining | indicates a hyperlink |
| *Italics* | indicates keywords (indexed) or instances of new terms and/or specialized words that need emphasis |
| CAPS | indicates a specific key selection, such as ENTER, TAB, CTRL, ALT, DELETE |
| `Code Font` | indicates command line entries or text that you'd type into a field |
| ">" delimiter | indicates how to navigate through a hierarchy of menu selections/options |

## Special Terms

The following special terms are used throughout this guide:

| | |
|---|---|
| *Card* | The SST-PB3-PCI-2 network interface card |
| *Channel* | Profibus network interface on the card |
| *DWORD* | Little Endian 32-bit value, unless otherwise stated |
| *Firmware Module* | The embedded software module that gets loaded to the card's memory and runs on the card. This is the operating system of the card, enabling it to respond to commands from the host and manage network communications. |
| *Host* | The computer system in which the card is installed |
| *Outputs* | Data that originate in the process controller and are transmitted to the field devices |
| *PFBSCAN* | The Profibus Scanner Module, which encapsulates both the pfb3.ss3 and pfb3-2.ss3 firmware modules |
| *Shared Memory* | On-card memory mapped to the host computer and shared between the firmware module and the host application |
| *.ss3* | An encoded firmware module for the card |
| *WORD* | Little Endian 16-bit value, unless otherwise stated |

## Special Notation

The following special notation is used throughout this guide:

### Note

A note provides additional information, emphasizes a point, or gives a tip for easier operation. Notes are accompanied by the symbol shown, and follow the text to which they refer.

# 1 Introduction

## Chapter Sections:

- PFBSCAN Overview
- Terminology

# 1.1 PFBSCAN Overview

PFBSCAN refers to two different firmware modules: pfb3.ss3, and pfb3-2.ss3. Pfb3-2.ss3 will be used on the new expanded I/O Profibus interface card, the SST-PFB3-PCI-2. Pfb3-2.ss3 has the same characteristics and performance as the original pfb3.ss3 module, except for where specified in this document.

### General Module Capabilities

The Profibus Scanner Module allows an SST-PFB3 interface card to:

- Function as a DP Master
- Function as a DP Slave
- Send and receive FDL (Layer 2) messages
- Support simultaneous operation in all of the above modes
- Support the standard Profibus baud rates of 9.6K, 19.2K, 31.25K, 45.45K, 93.75K, 187.5K, 500K, 1.5M, 3M, 6M and 12M

### Additional Module Capabilities

- Maintains an active station list for the network and can update a list of passive stations, on demand
- Maintains diagnostic counters for all the card operations
- Maintains an event queue where the host can be notified of various events occurring in the DP master, DP slave, and so on. These events can be disabled or enabled independently.

### Card as Master

- Can control up to 125 slaves
- Supports up to 244 bytes of input data per slave, 16 Kbytes total input data for all slaves for the original cards, and 32 Kbytes for the expanded I/O card
- Supports up to 244 bytes of output data per slave, 16 Kbytes total output data for all slaves for the original cards, and 32 Kbytes for the expanded I/O card
- Can generate an event and an optional interrupt on:
    - Receive data change from any slave
    - Updates from any slave
    - Scan done
    - Transition to error
    - Transition to OK

### Card as Slave

- Supports up to 244 bytes of input data and up to 244 bytes of output data
- Can generate an event and an optional interrupt on:
    - Received data change
    - Slave update by master
    - State change to run
    - State change to stop
    - Transition to slave error
    - Transition to slave OK

### Layer 2 (FDL) Interface

- Allows configuration of up to 64 SAPs
- Has an optional timeout watchdog on any SAP
- Supports up to 128 message blocks at one time
- Can generate an event and an optional interrupt on:
    - Received data change
    - Message or SAP update
    - Message or SAP error

# 2
# PFBMAN32 DLL API

## Chapter Sections:

- Application Programming Interface (API) for the PFBMAN32 DLL

## 2.1 Introduction

This section defines the API *(Application Programming Interface)* for the PFBMAN32 DLL. All functions and data types are listed alphabetically.

## 2.2 Overview

PFBMAN32.DLL is a non-thread-safe 32-bit DLL. It provides a common interface that abstracts physical hardware to allow one application or DLL to interface with the Profibus Scanner module on different hardware platforms. It is for use with Windows NT, 2000 and XP.

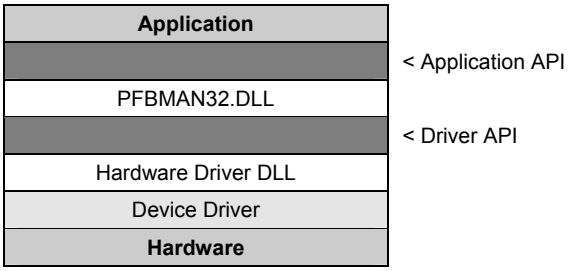
**Note**

This DLL is not supported under Windows NT for the SST-PB3-PCI-2 card.

## 2.3 Services

- PFBMAN32.DLL provides the following services:
- DLL revision details
- Hardware driver management
- Card management (multiple cards, multiple clients)
- Card abstraction using handles eliminates the need for the application to be aware of memory or I/O addresses
- Interrupt support (notification messages)
- Read/Write services at the block, word, byte and bit level

# 2.4 Application Stack




# 2.5 Quick Start Using Sample Utilities

## 2.5.1 Configuring the DP Master

The following steps explain how to configure the DP master using the SST PROFIBUS-exported **BSS** master configuration file or the Siemens COM PROFIBUS exported **2BF** master configuration file.

### 2.5.1.1 Configuring with SST PROFIBUS / Siemens COM PROFIBUS Master

1. Run **ssbincfg.exe**.
2. Open a connection to the card.
3. From the dialog box, select your BSS (SST) or 2BF (Siemens) file.
4. Click Open.
5. If the selected file was transferred successfully, a confirmation dialog box appears.

#### 2.5.1.2 Configuring Manually

1. Run **dpmascfg.exe**.
2. Open the card. The DP Master Configuration dialog box appears.
3. Set the global parameters: Min Cycle Time and Max Cycle Time.
4. For each slave, set the DP Master block parameters: Slave Station, RX/TX length, ParamMasSts, ParamWdFact1, ParamWdFact2, ParamRdyTime, ParamID and ChkData.

#### 2.5.1.3 Configuring the PFB Network

1. Run **pbnetcfg.exe**.
2. Open the card. The PFB Network Configuration box appears.
3. Set the following fields: Local Station, BAUD, and Option-Active. Additional fields use default values.

### 2.5.2 Configuring the DP Slave

Configure the slave's network parameters using PFB Network Configuration (see above).

1. Run **dpslvcfg.exe**.
2. Open the card. The DP Slave Dialog Box appears.
3. Set the RX/TX Length field. The other fields are optional.

### 2.5.3 PROFIBUS Command

1. Run **pfbcmd.exe**.
2. Open the card. The PFB Command dialog box appears.
3. Select the ONLINE command.

### 2.5.4 DP Monitor

1. Run **dpmon.exe**.
2. Open the card.
3. Select one of the tabs:
    - DP Network - displays all stations on the network
    - Diagnostics - monitors card local diagnostics
    - Master Directory - monitors all configured slaves
    - Master Data - monitors a specific slave's data
    - Master Diagnostics - monitors a specific slave's diagnostics
    - Slave Data - monitors data of the SST-PB3 slave services
    - Slave Diagnostics - monitors diagnostics of the SST-PB3 slave services

## 2.6 Operating the Application

The typical sequence of events for an application using the PROFIBUS Manager Interface DLL is:

1. If a specific version is required, check the PFBMAN32.DLL version (PFB_Version).

2. Load the hardware driver (PFB_LoadDriver, with the "sspfb32.dll" parameter). If a specific version is required, check the Hardware Driver DLL version (PFB_DriverVersion).

3. Open a card connection (PFB_OpenCard), where sharing type and firmware module load options are specified.

4. Clear the configuration buffers using PFB_Command (REINIT).

5. Configure the card to act as:

   **A DP Master**

   - Use a binary configuration image generated by the SST PROFIBUS Configuration tool (BSS)

   - Using various DLL APIs, such as PFB_PutMasGlbCfg, PFB_PutMasCfg, PFB_PutMasParmData and PFB_PutMasCfgChk to configure master parameters, and PFB_PutNetCfg to configure network parameters

   **A DP Slave:**

   - Using PFB_PutSlvCfg to configure slave parameters and PFB_PutNetCfg to configure network parameters

6. Put the card online (PFB_Command).

7. Put the DP Master into RUN mode by setting the PFB_MAS_CTRL_RUN_MODE bit in the pfbMasCntrlCfg register. Use PFB_GetMasGlbCfg to retrieve the current register value, then OR it with the PFB_MAS_CTRL_RUN_MODE bit in MasGlbCfg.pfbMasCntrlCfg. Write this register back to the card using PFB_PutMasGlbCntrlCfg.

8. Monitor RX/TX Data (PFB_GetMasRx/TxData, PFB_PutMasTxData, PFB_GetSlvRx/TxData, PFB_PutSlvTxData).

9. Go offline (PFB_Command).
10. Close the card connection (PFB_CloseCard).
11. Unload the driver (PFB_FreeDriver).

# 2.7 Card Access Types

#### 2.7.1.1 Using POINTERS

- Performance LEVEL 1 (fastest): the SS_HCONTROL load flag is required to control page switching and to collect knowledge of the card's structure.
- To get high-speed memory access, the application can point to the card. The PFB_GetCardPtr call maps card memory with a pointer. Using a pointer locks other applications out of using card memory.

**Note**

To unlock card memory once accessing is complete, the pointer needs to be freed (via the PFB_FreeCardPtr command).

#### 2.7.1.2 Using Direct I/O Calls (e.g., PFB_ReadByte, PFB_WriteByte, PFB_ReadWord)

- Performance LEVEL 2: the SS_HCONTROL load flag is required to control page switching. Access to memory offsets is also required.
- The application can access the card's memory via direct read and write function calls. It must control the page using Hardware Control calls (PFB_ReadHC, PFB_WriteHC).

#### 2.7.1.3 Using Direct Page I/O calls (e.g., PFB_PageReadByte, PFB_PageWriteByte, PFB_PageReadWord)

- Performance LEVEL 3: access to memory offsets is required
- Used for shared direct access to card memory. Page control is achieved through function calls.

#### 2.7.1.4 Using BUFFERS

- Performance LEVEL 4: no shared access limitations or offset knowledge

To share access to the card between applications without limitations, use standard PFBMAN32.DLL calls, such as PFB_Get/PutMasRx/TxData and PFB_GetSlvRx/TxData to access the card's memory.

**Note**

When a card is opened, it is locked, and cannot be opened by any other application. If an application fails to close a card connection, that card is unavailable to all applications until the computer is restarted.

# 2.8 General Resource Access

## 2.8.1 PFB_CancelWaitIrq

### 2.8.1.1 Description

Cancels a pending WaitIrq request.

### 2.8.1.2 Prototype

```
BOOL WINAPI PFB_CancelWaitIrq (DWORD CardHandle)
```

### 2.8.1.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |

### 2.8.1.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve error code. |

### 2.8.1.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0105 | Application Interrupt access denied (sharing violation) |

## 2.8.2 PFB_CloseCard

### 2.8.2.1 Description

Closes the previously opened card connection.

### 2.8.2.2 Prototype

```
BOOL WINAPI PFB_CloseCard (DWORD CardHandle)
```

### 2.8.2.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |

### 2.8.2.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve error code. |

### 2.8.2.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0100 | General failure error code |
| 2000 0102 | Invalid CardHandle |
| 2000 0003 | Driver not loaded |

## 2.8.3 PFB_DriverVersion

### 2.8.3.1 Description

Returns the Hardware DLL version information.

### 2.8.3.2 Prototype

```
BOOL WINAPI PFB_Driver (TCHAR* Buffer, WORD* Version, DWORD Size)
```

### 2.8.3.3 Arguments

| Argument | Description |
|---|---|
| Buffer | Driver identification string buffer |
| Version | Minor revision (LSB)<br>Major revision (MSB) |

### 2.8.3.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.3.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0114 | Invalid pointer - Buffer and/or Version |

## 2.8.4 PFB_EnumDrivers

### 2.8.4.1 Description

Returns the available driver name.

### 2.8.4.2 Prototype

```
BOOL WINAPI PFB_EnumDrivers (DWORD Index, char* Name, DWORD* Size)
```

### 2.8.4.3 Arguments

| Argument | Description |
|---|---|
| Index | Index of the card |
| Name | Buffer for storing the card name |
| Size | Size of the buffer for the card name. Returns the number of characters stored in the buffer. |

### 2.8.4.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.4.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |

## 2.8.5 PFB_FreeCardPtr

### 2.8.5.1 Description

Frees a pointer retrieved from a previous PFB_GetCardPtr call.

### 2.8.5.2 Prototype

```
BOOL WINAPI PFB_FreeCardPtr (DWORD CardHandle, volatile void* *ThePointer)
```

### 2.8.5.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| ThePointer | Pointer to be freed |

### 2.8.5.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.5.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 011a | Card access timeout |
| 2000 0114 | Invalid pointer - ThePointer |

## 2.8.6 PFB_FreeDriver

### 2.8.6.1 Description

Unloads the Hardware Driver DLL. The link-count for the driver is decremented and, if no other applications are using the driver, it is unloaded.

### 2.8.6.2 Prototype

```
BOOL WINAPI PFB_FreeDriver (void)
```

### 2.8.6.3 Arguments

This function has no arguments.

### 2.8.6.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.6.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |

## 2.8.7 PFB_GetBusType

### 2.8.7.1 Description

Gets the card's bus type.

### 2.8.7.2 Prototype

```
BOOL WINAPI PFB_GetBusType (DWORD CardHandle, DWORD* BusType)
```

### 2.8.7.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BusType | Pointer to a DWORD to receive the bus type |

### 2.8.7.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.7.5 Supported Bus Types

| Value | Description |
|---|---|
| 1 | ISA |
| 5 | PCI |
| 8 | PCMCIA |

### 2.8.7.6 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer – BusType |

## 2.8.8 PFB_GetCardPtr

### 2.8.8.1 Description

Gets a pointer to the start of a card's host interface memory.

### 2.8.8.2 Prototype

```
BOOL WINAPI PFB_GetCardPtr (DWORD CardHandle, volatile void* *ThePointer)
```

### 2.8.8.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| ThePointer | Pointer to be modified |

### 2.8.8.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.8.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 0114 | Invalid pointer - ThePointer |
| 2000 011a | Card access timeout |

## 2.8.9 PFB_GetHomePage

### 2.8.9.1 Description

Gets the Home Page.

### 2.8.9.2 Prototype

```
BOOL WINAPI PFB_GetHomePage (DWORD CardHandle, BYTE* HomePage)
```

### 2.8.9.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| HomePage | Destination of Home Page |

### 2.8.9.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.9.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0114 | Invalid pointer - HomePage |

## 2.8.10 PFB_GetMem

### 2.8.10.1 Description

Gets data from card-mapped memory.

### 2.8.10.2 Prototype

```
BOOL WINAPI PFB_GetMem (DWORD CardHandle, BYTE Page, WORD Ofs, WORD Len, BYTE*
DataBuf)
```

### 2.8.10.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Page | Page number of the data to be read |
| Ofs | Offset within the page (0-3fff) for original cards.<br>Offset within 2 pages (0-7fff) for the expanded I/O card. |
| Len | Length of a block to be read (1-4000) for original cards.<br>Length of a block to be read (1-8000) for the expanded I/O card. |
| DataBuf | Destination of data to be read |

### 2.8.10.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.10.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - DataBuf |
| 2000 011a | Card access timeout |

## 2.8.11 PFB_LoadDriver

### 2.8.11.1 Description

Loads the Hardware Driver DLL. The standard driver name is “sspfb32.dll”.

### 2.8.11.2 Prototype

```
BOOL WINAPI PFB_LoadDriver (TCHAR* DriverName )
```

### 2.8.11.3 Arguments

| Argument | Description |
|---|---|
| DriverName | Name and optional path to the hardware driver DLL |

### 2.8.11.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code |

### 2.8.11.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0000 | Driver loaded |
| 2000 0001 | Driver not found |
| 2000 0002 | Invalid driver |

## 2.8.12 PFB_OpenCard

### 2.8.12.1 Description

Opens a card connection. The card handle returned by this function is used by the DLL client to identify the card to all other services. You need to call PFB_CloseCard when your application does not require access it anymore. The limit of open connections to all PROFIBUS cards is 16.

### 2.8.12.2 Prototype

```
BOOL WINAPI PFB_OpenCard (DWORD* CardHandle, TCHAR* CardName, void* Module,
DWORD ModuleId, WORD ShareFlags, WORD LoadFlags)
```

### 2.8.12.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | Upon successful completion of PFB_OpenCard, CardHandle is used for subsequent API calls |
| CardName | The name assigned to the interface card during hardware installation (stored in registry). |
| Module | Set to NULL - reserved |
| ModuleId | The ID of the required application module (0xBB01 for original cards, and 0xBB03 for the expanded I/O card). |
| ShareFlags | Connection share flags (see below) |
| LoadFlags | Application module loader flags (see below) |

### 2.8.12.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.12.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0101 | CardHandle not available |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with SS_WRITE flag. |
| 2000 0104 | Card Interrupt access denied (sharing violation) |
| 2000 0105 | Application Interrupt access denied (sharing violation) |
| 2000 0106 | Hardware Control access denied (sharing violation). Card is already opened with SS_HCONTROL flag. |
| 2000 0107 | Overlap conflict |
| 2000 0109 | Card not found (incorrect hardware configuration) |
| 2000 010b | Invalid / damaged application module |
| 2000 010d | Card diagnostic failure |
| 2000 0114 | Invalid pointer - CardHandle |
| 2000 0115 | Invalid interrupt level |
| 2000 0116 | Invalid I/O address |
| 2000 0117 | Invalid I/O length |
| 2000 0118 | Invalid memory address |
| 2000 0119 | Invalid memory length |
| 2000 011a | Card access timeout |
| 2000 011b | Driver access denied |
| 2000 011d | Module load request denied |
| 2000 011f | CPU not running. Module must be reloaded. |
| 2000 0121 | Timeout waiting for alive signal from BOOT program. |
| 2000 0122 | Timeout waiting for module diagnostics, or module failure. |

### 2.8.12.6 ShareFlags

This argument controls multiple application arbitration for a single card.

| Bit | Name | Description |
|---|---|---|
| 0 | SS_WRITE | Card is opened for shared write access |
| 1 | SS_XWRITE | Card is opened for exclusive write access |
| 2 | SS_HCONTROL | Card is opened for exclusive hardware control access |
| 3 | SS_CARDIRQ | Card is opened for exclusive card interrupt access (interrupts from the application to the card) |
| 4 | SS_APPIRQ | Card is opened for exclusive application interrupt access (interrupts from the card to the application) |
| 5-7 | Reserved | Reserved. Set to 0. |
| 8 | SS_USER1** | Exclusive user access 1 |
| 9 | SS_USER2** | Exclusive user access 2 |
| 10 | SS_USER3** | Exclusive user access 3 |
| 11 | SS_USER4** | Exclusive user access 4 |
| 12-13 | Reserved | Reserved. Set to 0. |
| 14 | SS_OVERLAP | Overlapped cards are supported for PFB3-ISA / 104 cards only, under Windows NT. |
| 15 | Reserved | Reserved. Set to 0. |

** Exclusive user access flags are used to avoid conflicts between applications sharing access to the same card. The meaning of these flags is application specific.

### 2.8.12.7 LoadFlags

This argument controls the application module loader and also selects some connection modes of operation.

**Note**

The SS_GO_OFF_ONCLOSE and SS_STAY_RUN_ONCLOSE flags take effect only when the application is closing and there are no other applications connected to the card. If neither of these flags are set, the card is put in PROGRAM mode (shuts down the outputs).

| Bit | Name | Description |
|---|---|---|
| 0 | SS_REPLACE | Do not replace module if it's already loaded. If the firmware has never been loaded, the application opening the connection must be the only one with write access. |
| 1 | SS_RELOAD | If no other applications have write access, reload the specified module. Opening more than one connection at the same time with this flag set is not permitted and will result in the MODULE_LOAD_REQUEST_DENIED error. |
| 3 | SS_GO_OFF_ONCLOSE | Last application's option to take card OFFLINE when finished |
| 4 | SS_STAY_RUN_ONCLOSE | Last application's option to leave the card in unchanged state |
| 6-15 | Reserved | Always 0 |

## 2.8.13 PFB_PageReadBit

### 2.8.13.1 Description

Reads a bit from the card host interface memory of a specific page.

### 2.8.13.2 Prototype

```
BOOL PFB_PageReadBit (DWORD CardHandle, DWORD Offset, DWORD Bit, BYTE* Buffer,
BYTE Page)
```

### 2.8.13.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the byte containing the target bit |
| Bit | The target bit within the byte to be read (0-7) |
| Buffer | Contains the value of bit read |
| Page | Page number to read from |

### 2.8.13.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.13.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 010e | Invalid offset |
| 2000 010f | Invalid Bit number (0-7) |
| 2000 0114 | Invalid pointer - Buffer |
| 2000 011a | Card access timeout |
| 2000 011e | Invalid Page (0-15) |

## 2.8.14 PFB_PageReadBlock

### 2.8.14.1 Description

Reads a block of data from the card host interface memory of a specific page.

### 2.8.14.2 Prototype

```
BOOL PFB_PageReadBlock (DWORD CardHandle, DWORD Offset, void* Block, DWORD
Size, BYTE Page)
```

### 2.8.14.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the first byte of the target block (0x0000 - 0x3FFF) for original cards.<br>The offset from the start of the host interface memory to the first byte of the target block (0x0000 – 0x7FFF) for expanded I/O cards. |
| Block | Pointer to the buffer for data read |
| Size | Number of bytes to read |
| Page | Page number to read from |

### 2.8.14.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.14.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 010e | Invalid offset |
| 2000 0110 | Invalid Size |
| 2000 0114 | Invalid pointer - Block |
| 2000 011a | Card access timeout |
| 2000 011e | Invalid Page (0-15) |

## 2.8.15 PFB_PageReadByte

### 2.8.15.1 Description

Reads an 8-bit byte from the card host interface memory of a specific page.

### 2.8.15.2 Prototype

```
BOOL PFB_PageReadByte (DWORD CardHandle, DWORD Offset, BYTE* Buffer, BYTE Page)
```

### 2.8.15.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the target byte (0x0000 - 0x3FFF) |
| Buffer | Buffer for value read |
| Page | Page number to read from |

### 2.8.15.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.15.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 010e | Invalid offset |
| 2000 0114 | Invalid pointer - Buffer |
| 2000 011a | Card access timeout |
| 2000 011e | Invalid Page (0-15) |

## 2.8.16 PFB_PageReadWord

### 2.8.16.1 Description

Reads a 16-bit word from the card host interface memory of a specific page.

### 2.8.16.2 Prototype

```
BOOL PFB_PageReadWord (DWORD CardHandle, DWORD Offset, WORD* Buffer, BYTE Page)
```

### 2.8.16.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the first byte (LSB) of the target word (0x0000 - 0x3FFE) |
| Buffer | Buffer to receive data word read |
| Page | Page number to read from |

### 2.8.16.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.16.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 010e | Invalid offset |
| 2000 0114 | Invalid pointer - Buffer |
| 2000 011a | Card access timeout |
| 2000 011e | Invalid Page (0-15) |

## 2.8.17 PFB_PageToggleBit

### 2.8.17.1 Description

Toggles a bit in the card host interface memory on a specific page.

### 2.8.17.2 Prototype

```
BOOL PFB_PageToggleBit (DWORD CardHandle, DWORD Offset, DWORD Bit, BYTE Page)
```

### 2.8.17.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the byte containing the target bit (0x0000 - 0x3FFF) |
| Bit | The target bit within the byte to be toggled (0-7) |
| Page | Page number to toggle on |

### 2.8.17.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.17.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag |
| 2000 010e | Invalid offset |
| 2000 010f | Invalid Bit number (0-7) |
| 2000 011a | Card access timeout |
| 2000 011e | Invalid Page (0-15) |

## 2.8.18 PFB_PageWriteBit

### 2.8.18.1 Description

Writes a bit in the card host interface memory to a specific page.

### 2.8.18.2 Prototype

```
BOOL PFB_PageWriteBit (DWORD CardHandle, DWORD Offset, DWORD Bit, DWORD Data,
BYTE Page)
```

### 2.8.18.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the byte containing the target bit (0x0000 - 0x3FFF) |
| Bit | The target bit within the byte to be written (0-7) |
| Data | The data value to write (a non-zero value sets the bit) |
| Page | Page number to write to |

### 2.8.18.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.18.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 010e | Invalid offset |
| 2000 010f | Invalid Bit number (0-7) |
| 2000 011a | Card access timeout |
| 2000 011e | Invalid Page (0-15) |

## 2.8.19 PFB_PageWriteBlock

### 2.8.19.1 Description

Writes a block of data to the card host interface memory of a specific page.

### 2.8.19.2 Prototype

```
BOOL PFB_PageWriteBlock (DWORD CardHandle, DWORD Offset, void* Block, DWORD
Size, BYTE Page)
```

### 2.8.19.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the first byte of the target block (0x0000 - 0x3FFF) for the original cards.<br>The offset from the start of the host interface memory to the first byte of the target block (0x0000 – 7FFF) for expanded I/O cards. |
| Block | Pointer to data to be written |
| Size | Number of bytes to write |
| Page | Page number to write to |

### 2.8.19.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.19.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 010e | Invalid offset |
| 2000 0110 | Invalid Size |
| 2000 0114 | Invalid pointer |
| 2000 011a | Card access timeout |
| 2000 011e | Invalid Page (0-15) |

## 2.8.20 PFB_PageWriteByte

### 2.8.20.1 Description

Writes an 8-bit byte to the card host interface memory of a specific page.

### 2.8.20.2 Prototype

```
BOOL PFB_PageWriteByte (DWORD CardHandle, DWORD Offset, BYTE Data, BYTE Page)
```

### 2.8.20.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the target byte (0x0000 - 0x3FFF) |
| Data | Data byte to write |
| Page | Page number to write to |

#### 2.8.20.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

#### 2.8.20.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 010e | Invalid offset |
| 2000 011a | Card access timeout |
| 2000 011e | Invalid Page (0-15) |

### 2.8.21 PFB_PageWriteWord

#### 2.8.21.1 Description

Writes a 16-bit word to the card host interface memory of a specific page.

#### 2.8.21.2 Prototype

```
BOOL PFB_PageWriteWord (DWORD CardHandle, DWORD Offset, WORD Data, BYTE Page)
```

#### 2.8.21.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the first byte (LSB) of the target word (0x0000 - 0x3FFE) |
| Data | Data word to write |
| Page | Page number to write to |

### 2.8.21.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.21.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 010e | Invalid offset |
| 2000 011a | Card access timeout |
| 2000 011e | Invalid Page (0-15) |

## 2.8.22 PFB_PutMem

### 2.8.22.1 Description

Writes data in the card-mapped memory.

### 2.8.22.2 Prototype

```
BOOL WINAPI PFB_PutMem (DWORD CardHandle, BYTE Page, WORD Ofs, WORD Len, BYTE*
DataBuf)
```

### 2.8.22.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Page | Page number the data is to be written to |
| Ofs | Offset within the page (0-3FFFh) for original cards.<br>Offset within 2 pages (0-7FFFh) for the expanded I/O card. |
| Len | Length of a block to be written (1-4000h) |
| DataBuf | Source of data to be written |

### 2.8.22.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.22.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

## 2.8.23 PFB_ReadBit

### 2.8.23.1 Description

Reads a bit from the card host interface memory.

### 2.8.23.2 Prototype

```
BOOL PFB_ReadBit (DWORD CardHandle, DWORD Offset, DWORD Bit, BYTE* Buffer)
```

### 2.8.23.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the byte containing the target bit (0-3FFFh) |
| Bit | The target bit within the byte to be read (0-7) |
| Buffer | Contains the value of the bit read |

### 2.8.23.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.23.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 010e | Invalid offset |
| 2000 010f | Invalid bit number (0-7) |
| 2000 0114 | Invalid pointer – Buffer |
| 2000 011a | Card access timeout (Card is in OverLap Mode) |

## 2.8.24 PFB_ReadBlock

### 2.8.24.1 Description

Reads a block of data from the card host interface memory.

### 2.8.24.2 Prototype

```
BOOL PFB_ReadBlock (DWORD CardHandle, DWORD Offset, void* Block, DWORD Size)
```

### 2.8.24.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the first byte of the target block (0 - 3FFFh) |
| Block | Pointer to buffer for data read |
| Size | Number of bytes to read |

### 2.8.24.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.24.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 010e | Invalid offset |
| 2000 0110 | Invalid Size |
| 2000 0114 | Invalid pointer – Block |
| 2000 011a | Card access timeout (Card is in OverLap Mode) |

## 2.8.25 PFB_ReadByte

### 2.8.25.1 Description

Reads an 8-bit byte from the card host interface memory.

### 2.8.25.2 Prototype

```
BOOL PFB_ReadByte (DWORD CardHandle, DWORD Offset, BYTE* Buffer)
```

### 2.8.25.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the target byte (0 - 3FFFh) |
| Buffer | Buffer for value read |

### 2.8.25.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.25.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 010e | Invalid offset |
| 2000 0114 | Invalid pointer – Buffer |
| 2000 011a | Card access timeout (Card is in OverLap Mode) |

## 2.8.26 PFB_ReadHC

### 2.8.26.1 Description

Reads a hardware control signal.

### 2.8.26.2 Prototype

```
BOOL PFB_ReadHC (DWORD CardHandle, WORD Signal, WORD* Buffer)
```

### 2.8.26.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Signal | Hardware control signal ID (see below) |
| Buffer | Value of control signal read |

### 2.8.26.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve error code. |

### 2.8.26.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0111 | Invalid Signal ID |
| 2000 0114 | Invalid pointer – Buffer |
| 2000 0120 | PCI Card does not support port addressing |

### 2.8.26.6 Signal ID

| Signal ID | Name | Access | Description |
|---|---|---|---|
| 4 | PFB3_CTRL_OFS | R/W | Control Register. See below. |
| 5 | PFB3_ADDR_OFS | R | AddrMatch Register. See below. |
| 6 | PFB3_BANK_OFS | R | BankSelect Register. See below. |
| 7 | PFB3_WINSIZE_OFS | R | WinSize Register. See below. |
| 8 | PFB3_HOSTIRQ_OFS | R | HostIrq Register. See below. |
| 9 | PFB3_LED_OFS | R | LedReg Register. See below. |
| 10 | PFB3_DEBUG_OFS | R/W | Debug Register. See below. |
| 11 | PFB3_HDR_OFS | R/W | HDR Register. See below. |
| 12-255 | Reserved | - | - |

### 2.8.26.7 Control Register (PFB3_CTRL_OFS)

| Bit Offsets and Names | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | 6 | 5 | 4 | 2 | 3 | 1 | 0 |
| CardRun | MemEn | IntEn | WdTout | HostIrq1 | HostIrq0 | CardIrq1 | CardIrq0 |

The following table describes each Control Register Bit:

| Bit Name | Description |
|---|---|
| CardRun | High (1) indicates that the card is in “Run” mode (CPU is out of reset and will attempt to execute firmware). Low (0) indicates that the card is in “Stop” mode (CPU is in reset) or a WdTout has occurred (also see WdTout bit). |
| MemEn | High (1) enables shared memory decoding of addresses in this board’s range. This board’s range is defined by the AddrMatch register. |
| IntEn | High (1) enables interrupts on IrqLevel when a HostIrq bit is high (1). |
| WdTout | High (‘1’) indicates that a watchdog timeout has occurred. |
| HostIrq1<br>HostIrq0 | High (‘1’) indicates that the specified interrupt is in progress and has not yet been serviced.<br>Writing HostIrq1, HostIrq0 high (‘1’) causes the pending Host interrupt to end (via the Interrupt service routine running on the host) |
| CardIrq1<br>CardIrq0 | Writing CardIrq1, CardIrq0 high (‘1’) generates an interrupt to the card at the appropriate level |

### 2.8.26.8 AddrMatch Register (PFB3_ADDR_OFS)

| Bit Offsets and Names | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | 6 | 5 | 4 | 2 | 3 | 1 | 0 |
| Enable | A18 | A17 | A16 | A15 | A14 | - | - |

This register always reads zero, and writing to it has no effect.

### 2.8.26.9 BankSelect Register (PFB3_BANK_OFS)

| Bit Offsets and Names | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | 6 | 5 | 4 | 2 | 3 | 1 | 0 |
| 0 | 0 | 0 | BA17 | BA15 | BA14 | - | - |

This register always reads zero, and writing to it has no effect.

### 2.8.26.10 WinSize Register (PFB3_WINSIZE_OFS)

| Bit Offsets and Names | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| WS19 | WS18 | WS17 | WS16 | WS15 | WS14 | WS13 | WS12 |

This register always reads 0x3F, and writing to it has no effect.

### 2.8.26.11 HostIrq Register (PFB3_HOSTIRQ_OFS)

| Bit Offsets and Names | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| - | - | - | - | Int_sel_3 | Int_sel_2 | Int_sel_1 | Int_sel_0 |

This register always reads zero, and writing to it has no effect.

### 2.8.26.12 LedReg Register (PFB3_LED_OFS)

The LedReg register represents the state of the card's LEDs. The state of this register is controlled by firmware.

| Bit Offsets and Names | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| - | - | - | - | CommRed | CommGm | SysRed | SysGrn |

The Communication LED conforms to the following standard.

| CommGrn | CommRed | LED Color |
|---|---|---|
| 0 | 0 | Off |
| 0 | 1 | Red |
| 1 | 0 | Green |
| 1 | 1 | Amber |

The System LED conforms to the following standard.

| SysGrn | SysRed | LED Color |
|---|---|---|
| 0 | 0 | Off |
| 0 | 1 | Red |
| 1 | 0 | Green |
| 1 | 1 | Amber |

### 2.8.26.13 Debug Register PFB3_DEBUG_OFS)

| Bit Offsets and Names | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| HWReset | - | - | JTAGGEN | CPUTRST | CPUTMS | CPUTDI | CPUTCK |

Reserved for future use.

### 2.8.26.14 HDR Register (PFB3_HDR_OFS)

| Bit Offsets and Names | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| HostDataReg (written by CPU) | | | | | | | |

Reserved for future use.

## 2.8.27 PFB_ReadWord

DescriptionReads a 16-bit word from the card host interface memory.

### 2.8.27.1 Prototype

```
BOOL PFB_ReadWord (DWORD CardHandle, DWORD Offset, WORD* Buffer)
```

### 2.8.27.2 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the first byte (LSB) of the target word (0 - 3FFEh) |
| Buffer | Buffer to receive data word read |

### 2.8.27.3 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.27.4 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 010e | Invalid offset |
| 2000 0114 | Invalid pointer – Buffer |
| 2000 011a | Card access timeout (Card is in OverLap Mode) |

## 2.8.28 PFB_SetAccessTimeout

### 2.8.28.1 Description

Sets the card access timeout delay.

### 2.8.28.2 Prototype

```
BOOL WINAPI PFB_SetAccessTimeout (DWORD CardHandle, DWORD Timeout)
```

### 2.8.28.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Timeout | The access timeout delay in milliseconds (default is 1 sec) |

### 2.8.28.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.28.5 Errors

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |

## 2.8.29 PFB_ToggleBit

### 2.8.29.1 Description

Toggles a bit in the card host interface memory.

### 2.8.29.2 Prototype

```
BOOL PFB_ToggleBit( DWORD CardHandle, DWORD Offset, DWORD Bit )
```

### 2.8.29.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the byte containing the target bit (0 - 3FFFh) |
| Bit | The target bit within the byte to be toggled (0-7) |

### 2.8.29.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

#### 2.8.29.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 010e | Invalid offset |
| 2000 010f | Invalid Bit number (0-7) |
| 2000 011a | Card access timeout (Card is in OverLap Mode) |

## 2.8.30 PFB_Version

### 2.8.30.1 Description

Gets the Hardware Driver version information.

### 2.8.30.2 Prototype

```
BOOL PFB_Version (TCHAR* Buffer, WORD* Version, DWORD Size)
```

### 2.8.30.3 Arguments

| Argument | Description |
|---|---|
| Buffer | Buffer to receive the DLL version string |
| Version | Word to contain the DLL versions number<br>MSB - Major revision<br>LSB - Minor revision |
| Size | The size of the buffer (version string is truncated to fit) |

### 2.8.30.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

#### 2.8.30.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0201 | Invalid pointer - Buffer |
| 2000 0202 | Invalid pointer - Version |

## 2.8.31 PFB_WaitIrq

### 2.8.31.1 Description

Waits for card interrupt.

### 2.8.31.2 Prototype

```
BOOL WINAPI PFB_lWaitIrq (DWORD CardHandle)
```

### 2.8.31.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |

### 2.8.31.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.31.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Application Irq access denied |

## 2.8.32 PFB_WriteBit

### 2.8.32.1 Description

Writes a bit in the card's host interface memory.

### 2.8.32.2 Prototype

```
BOOL PFB_WriteBit (DWORD CardHandle, DWORD Offset, DWORD Bit, DWORD Data)
```

### 2.8.32.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the byte containing the target bit (0x0000 - 0x3FFF) |
| Bit | The target bit within the byte to be written (0-7) |
| Data | The data value to write (a non-zero value sets the bit) |

### 2.8.32.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.32.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 010e | Invalid offset |
| 2000 010f | Invalid Bit number (0-7) |
| 2000 011a | Card access timeout (Card is in OverLap Mode) |

## 2.8.33 PFB_WriteBlock

### 2.8.33.1 Description

Writes a block of data to the card's host interface memory.

### 2.8.33.2 Prototype

```
BOOL PFB_WriteBlock (DWORD CardHandle, DWORD Offset, void* Block, DWORD Size)
```

### 2.8.33.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the first byte of the target block (0 - 3FFFh) |
| Block | Pointer to data to be written |
| Size | Number of bytes to write |

### 2.8.33.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.33.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 010e | Invalid offset |
| 2000 0110 | Invalid Size |
| 2000 011a | Card access timeout (Card is in OverLap Mode) |

## 2.8.34 PFB_WriteByte

### 2.8.34.1 Description

Writes an 8-bit byte to the card's host interface memory.

### 2.8.34.2 Prototype

```
BOOL PFB_WriteByte (DWORD CardHandle, DWORD Offset, BYTE Data)
```

### 2.8.34.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the target byte (0 - 3FFFh) |
| Data | Data byte to write |

### 2.8.34.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.8.34.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 011a | Card access timeout (card is in OverLap Mode) |
| 2000 0102 | Invalid card handle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 010e | Invalid offset |

## 2.8.35 PFB_WriteHC

### 2.8.35.1 Description

Writes a hardware control signal.

### 2.8.35.2 Prototype

```
BOOL PFB_WriteHC (DWORD CardHandle, DWORD Signal, WORD Data)
```

### 2.8.35.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Signal | Hardware control signal ID |
| Data | New signal value |

### 2.8.35.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error, use GetLastError to retrieve error code |

### 2.8.35.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0106 | Hardware Control access denied (sharing violation), card is already opened with SS_HCONTROL flag |
| 2000 0111 | Invalid Signal ID |
| 2000 0113 | Invalid Signal Value |
| 2000 0120 | PCI Card does not support port addressing. |

### 2.8.35.6 Signal ID

| Signal ID | Name | Access | Description |
|---|---|---|---|
| 4 | PFB3_CTRL_OFS | R/W | Control Register. See below. |
| 5 | PFB3_ADDR_OFS | R | AddrMatch Register. See below. |
| 6 | PFB3_BANK_OFS | R | BankSelect Register. See below. |
| 7 | PFB3_WINSIZE_OFS | R | WinSize Register. See below. |
| 8 | PFB3_HOSTIRQ_OFS | R | HostIrq Register. See below. |
| 9 | PFB3_LED_OFS | R | LedReg Register. See below. |
| 10 | PFB3_DEBUG_OFS | R/W | Debug Register. See below. |
| 11 | PFB3_HDR_OFS | R/W | HDR Register. See below. |
| 12-255 | Reserved | - | - |

### 2.8.35.7 Control Register (PFB3_CTRL_OFS)

| Bit Offsets and Names | | | | | | | |
|---|---|---|---|---|---|---|---|
| **7** | **6** | **5** | **4** | **2** | **3** | **1** | **0** |
| CardRun | MemEn | IntEn | WdTout | HostIrq1 | HostIrq0 | CardIrq1 | CardIrq0 |

The following table describes each Control Register Bit:

| Bit Name | Description |
|---|---|
| CardRun | High (1) indicates that the card is in “Run” mode (CPU is out of reset and will attempt to execute firmware). Low (0) indicates that the card is in “Stop” mode (CPU is in reset) or a WdTout has occurred (also see WdTout bit). |
| MemEn | High (1) enables shared memory decoding of addresses in this board’s range. This board’s range is defined by the AddrMatch register. |
| IntEn | High (1) enables interrupts on IrqLevel when a HostIrq bit is high (1). |
| WdTout | High (‘1’) indicates that a watchdog timeout has occurred. |
| HostIrq1<br>HostIrq0 | High (‘1’) indicates that the specified interrupt is in progress and has not yet been serviced.<br>Writing HostIrq1, HostIrq0 high (‘1’) causes the pending Host interrupt to end (via the Interrupt service routine running on the host) |
| CardIrq1<br>CardIrq0 | Writing CardIrq1, CardIrq0 high (‘1’) generates an interrupt to the card at the appropriate level |

### 2.8.35.8 AddrMatch Register (PFB3_ADDR_OFS)

| Bit Offsets and Names | | | | | | | |
|---|---|---|---|---|---|---|---|
| **7** | **6** | **5** | **4** | **2** | **3** | **1** | **0** |
| Enable | A18 | A17 | A16 | A15 | A14 | - | - |

This register always reads zero, and writing to it has no effect.

### 2.8.35.9 BankSelect Register (PFB3_BANK_OFS)

| Bit Offsets and Names | | | | | | | |
|---|---|---|---|---|---|---|---|
| **7** | **6** | **5** | **4** | **2** | **3** | **1** | **0** |
| 0 | 0 | 0 | BA17 | BA15 | BA14 | - | - |

This register always reads zero, and writing to it has no effect.

### 2.8.35.10 WinSize Register (PFB3_WINSIZE_OFS)

| Bit Offsets and Names | | | | | | | |
|---|---|---|---|---|---|---|---|
| **7** | **6** | **5** | **4** | **3** | **2** | **1** | **0** |
| WS19 | WS18 | WS17 | WS16 | WS15 | WS14 | WS13 | WS12 |

This register always reads 0x3F, and writing to it has no effect.

### 2.8.35.11 HostIrq Register (PFB3_HOSTIRQ_OFS)

| Bit Offsets and Names | | | | | | | |
|---|---|---|---|---|---|---|---|
| **7** | **6** | **5** | **4** | **3** | **2** | **1** | **0** |
| - | - | - | - | Int_sel_3 | Int_sel_2 | Int_sel_1 | Int_sel_0 |

This register always reads zero, and writing to it has no effect.

### 2.8.35.12 LedReg Register (PFB3_LED_OFS)

The LedReg register represents the state of the card's LEDs. The state of this register is controlled by firmware.

| Bit Offsets and Names | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| - | - | - | - | CommRed | CommGm | SysRed | SysGrn |

The System LED conforms to the following standard.

| SysGrn | SysRed | LED Color |
|---|---|---|
| 0 | 0 | Off |
| 0 | 1 | Red |
| 1 | 0 | Green |
| 1 | 1 | Amber |

The Communication LED conforms to the following standard.

| CommGrn | CommRed | LED Color |
|---|---|---|
| 0 | 0 | Off |
| 0 | 1 | Red |
| 1 | 0 | Green |
| 1 | 1 | Amber |

### 2.8.35.13 Debug Register PFB3_DEBUG_OFS)

| Bit Offsets and Names | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| HWReset | - | - | JTAGGEN | CPUTRST | CPUTMS | CPUTDI | CPUTCK |

Reserved for future use.

### 2.8.35.14 HDR Register (PFB3_HDR_OFS)

| Bit Offsets and Names | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| HostDataReg (written by CPU) | | | | | | | |

Reserved for future use.

**Note**

Setting the memory page register for a PCI card is acceptable (the software will emulate the page setting). All other calls to PFB_WriteHC() are illegal for PCI cards.

## 2.8.36 PFB_WriteWord

### 2.8.36.1 Description

Writes a 16-bit word to the card host interface memory.

### 2.8.36.2 Prototype

```
BOOL PFB_WriteWord (DWORD CardHandle, DWORD Offset, WORD Data)
```

### 2.8.36.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Offset | The offset from the start of the host interface memory to the first byte (LSB) of the target word (0x0000 - 0x3FFE) |
| Data | Data word to write |

### 2.8.36.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

#### 2.8.36.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card has already been opened, with exclusive write access. |
| 2000 010e | Invalid offset |
| 2000 011a | Card access timeout (card is in OverLap Mode) |

# 2.9 Profibus Network

## 2.9.1 PFB_AckStnChange

### 2.9.1.1 Description

Acknowledges a station change.

### 2.9.1.2 Prototype

```
BOOL PFB_AckStnChange (DWORD CardHandle)
```

### 2.9.1.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |

### 2.9.1.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

#### 2.9.1.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

## 2.9.2 PFB_Command

### 2.9.2.1 Description

Executes PFBSCAN module commands.

### 2.9.2.2 Prototype

```
BOOL WINAPI PFB_Command (DWORD CardHandle, TCHAR* Command)
```

### 2.9.2.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Command | Name of the command to be executed |

### 2.9.2.4 Commands

| Command | Description |
|---|---|
| “auto_dp_cfg” | Automatically builds master control blocks for DP slaves (requires version 1.55 of the firmware or greater) |
| “autobaud” | Automatic Baud Detect |
| “cfg_2bf_shram” | Configure card with a binary image (COM PROFIBUS format) |
| “cfg_abf_shram” | Configure card with a binary image (BSS format) |
| “cfg_flash_go_on” | Configure network and master parameters from flash, and then go on line |
| “cfg_from_flash” | Configure card with configuration in flash |
| “chk_net_cfg” | Check network parameters and assign defaults |
| “clear_err” | Clear card error |
| “clr_cfg_buf” | Clear pfbBinCfgPage |
| “cpy_mas_cfg” | Copy a page of configuration from pfbBinCfgPage |
| “mas_assign_addr” | Assign and fill in data address (page/offset) for DP master |
| “online” | Put card online |
| “offline” | Put card offline; clear network, master and slave configuration. Card must be reconfigured |
| “pgm_to_flash” | Program flash with current configuration |
| “reinit” | Reinitialize memory and all parameters |

### 2.9.2.5 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

#### 2.9.2.6 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0215 | Invalid command |
| 2000 0216 | Not Online state (Command = “offline”) |
| 2000 0217 | No error to clear (Command = “clear_err”) |
| 2000 0218 | Not Offline state (all commands except : “offline” and “clear_err”) |
| 2000 0219 | Timeout executing command |
| 2000 03xx | Status Error (refer to definitions related to pfbStatus in Section 4.1.1.1). |

## 2.9.3 PFB_GetCardStatus

### 2.9.3.1 Description

Gets the card status structure.

### 2.9.3.2 Prototype

```
BOOL WINAPI PFB_GetCardStatus (DWORD CardHandle, PFB_CARD_STS* CrdSts).
For details, refer to PFB_CARD_STS, in Section 4.1.1.1.
```

### 2.9.3.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| CrdSts | Destination of card status |

### 2.9.3.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

#### 2.9.3.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - CrdSts |
| 2000 011a | Card access timeout |

## 2.9.4 PFB_GetCountersSts

### 2.9.4.1 Description

Gets the counter status. To initialize the counters, use the PFB_InitCounters function. The card then clears the counters to 0 and sets CntrsSts to 0.

### 2.9.4.2 Prototype

```
BOOL PFB_GetCountersSts (DWORD CardHandle, BYTE* CtrsSts)
```

### 2.9.4.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| CtrsSts | Destination of counters status |

### 2.9.4.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

#### 2.9.4.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - CtrsSts |
| 2000 011a | Card access timeout |

## 2.9.5 PFB_GetDiagCounters

### 2.9.5.1 Description

Gets a local diagnostic counters list.

### 2.9.5.2 Prototype

```
BOOL WINAPI PFB_GetDiagCounters (DWORD CardHandle, PFB_DIAG_CTRS* DiagCtrs).
For details, refer to PFB_DIAG_CTRS, in Section 4.1.2.1.
```

### 2.9.5.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| DiagCtrs | Destination of local diagnostic counters |

### 2.9.5.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.9.5.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - DiagCtrs |
| 2000 011a | Card access timeout |

## 2.9.6 PFB_GetEvent

### 2.9.6.1 Description

Gets an event and its argument, and checks for more queue events.

### 2.9.6.2 Prototype

```
BOOL WINAPI PFB_GetEvent (DWORD CardHandle, WORD* Event, BOOL* MoreEvt)
```

### 2.9.6.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Event | Destination of event |
| MoreEvt | There are more events in queue (TRUE, FALSE) |

### 2.9.6.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.9.6.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 021a | Invalid Event pointer |
| 2000 021c | Invalid More Event pointer |

## 2.9.7 PFB_GetL2GlbCntrl

### 2.9.7.1 Description

Gets the Layer 2 global control register.

### 2.9.7.2 Prototype

```
BOOL WINAPI PFB_GetL2GlbCntrl (DWORD CardHandle, WORD* L2GlbCntrl)
```

### 2.9.7.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| L2GlbCntrl | Destination of Layer 2 global control register |

### 2.9.7.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.9.7.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - L2GlbCntrl |
| 2000 011a | Card access timeout |

## 2.9.8 PFB_GetL2GlbSts

### 2.9.8.1 Description

Gets the Layer 2 global status.

### 2.9.8.2 Prototype

```
BOOL WINAPI PFB_GetL2GlbSts (DWORD CardHandle, WORD* L2GlbSts)
```

### 2.9.8.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| L2GlbSts | Destination of Layer 2 global status |

### 2.9.8.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.9.8.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - L2GlbSts |
| 2000 011a | Card access timeout |

## 2.9.9 PFB_GetNetCfg

### 2.9.9.1 Description

Gets the network configuration parameters.

### 2.9.9.2 Prototype

```
BOOL WINAPI PFB_GetNetCfg (DWORD CardHandle, PFB_NET_CFG* NetCfgTable).
For details, refer to PFB_NET_CFG, in Section 4.2.2.1.
```

### 2.9.9.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| NetCfgTable | Destination of Network Configuration Data |

### 2.9.9.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.9.9.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - NetCfgTable |
| 2000 011a | Card access timeout |

## 2.9.10 PFB_GetStationList

### 2.9.10.1 Description

Gets the active station list.

### 2.9.10.2 Prototype

```
BOOL WINAPI PFB_GetStationList (DWORD CardHandle, PFB_STN_LST* StnLst).
For details, refer to PFB_STN_LST, in Section 4.2.1.1.
```

### 2.9.10.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| StnLst | Destination of Station List |

### 2.9.10.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.9.10.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - StnLst |
| 2000 011a | Card access timeout |

## 2.9.11 PFB_InitCounters

### 2.9.11.1 Description

Initializes diagnostic counters. All counters are cleared to 0.

### 2.9.11.2 Prototype

```
BOOL PFB_InitCounters (DWORD CardHandle)
```

### 2.9.11.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |

### 2.9.11.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.9.11.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

## 2.9.12 PFB_PutNetCfg

### 2.9.12.1 Description

Configures the network parameters.

### 2.9.12.2 Prototype

```
BOOL WINAPI PFB_PutNetCfg (DWORD CardHandle, PFB_NET_CFG* NetCfgTable).
For details, refer to PFB_NET_CFG, in Section 4.2.2.1.
```

### 2.9.12.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| NetCfgTable | Source of Network Configuration Data |

### 2.9.12.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.9.12.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0204 | Invalid Event Enable state (refer to definitions related to pfbEvtEna, in Section 4.2.2.1). |
| 2000 0205 | Invalid Interrupt Enable state (refer to definitions related to pfbIntEna, in Section 4.2.2.1). |
| 2000 0206 | Invalid Station number (0-126) |
| 2000 0207 | Invalid Highest Station (0-126, 255 - disable) |
| 2000 0208 | Invalid Active state (0,1) |
| 2000 0209 | Invalid Baud rate (refer to definitions related to pfbBaud, in Section 4.2.2.1). |
| 2000 020a | Invalid Options (refer to definitions related to pfbOptions, in Section 4.2.2.1). |
| 2000 020b | Invalid Target Token Rotation Time<br>(256-16,777,215 tBit, 0-card sets default value) |
| 2000 020c | Invalid Slot Time (37-16,383 tBit, 0-card set default value) |
| 2000 020d | Invalid Idle Time 1 (35-1,023 tBit, 0-card set default value) |
| 2000 020e | Invalid Idle Time 2 (35-1,023 tBit, 0-card set default value) |
| 2000 020f | Invalid Ready Time (11-1,023 tBit, 0-card set default value) |
| 2000 0210 | Invalid Quiet Time (0-127 tBit, 255-card set default value) |
| 2000 0211 | Invalid Token Retry Limit (0-15) |
| 2000 0212 | Invalid Message Retry Limit (0-15) |
| 2000 0213 | Invalid Token Error Limit (0-255) |
| 2000 0214 | Invalid Response Error Limit (0-15) |
| 2000 021b | Network configuration error |
| 2000 03xx | Status Error (refer to definitions related to pfbStatus in Section 4.1.1.1). |
| 2000 04xx | Not Offline state - cannot configure<br>(xx contains current command) |

## 2.9.13 PFB_UpdatePassiveStn

### 2.9.13.1 Description

Updates a passive station in the Active Station List.

### 2.9.13.2 Prototype

```
BOOL PFB_UpdatePassiveStn (DWORD CardHandle)
```

### 2.9.13.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |

### 2.9.13.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.9.13.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 025a | Timeout updating passive stations |

# 2.10 DP Master API

## 2.10.1 PFB_AckMasDiagEvent

### 2.10.1.1 Description

Acknowledges a master diagnostic event so that the next master diagnostic block event can be processed.

### 2.10.1.2 Prototype

```
BOOL WINAPI PFB_AckMasDiagEvent (DWORD CardHandle, BYTE MasBlk)
```

### 2.10.1.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasBlk | Master Control Block number (0-124) |

### 2.10.1.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.1.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0228 | Invalid Master Block Number |

## 2.10.2 PFB_AckMasError

### 2.10.2.1 Description

Acknowledges a master error so that the next master block error can be processed.

### 2.10.2.2 Prototype

```
BOOL WINAPI PFB_AckMasError (DWORD CardHandle, BYTE MasBlk)
```

### 2.10.2.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasBlk | Master Control Block number (0-124) |

### 2.10.2.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.2.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0228 | Invalid Master Block Number |

## 2.10.3 PFB_AckMasEvent

### 2.10.3.1 Description

Acknowledges a master event so that the next master block event can be processed.

### 2.10.3.2 Prototype

```
BOOL WINAPI PFB_AckMasEvent (DWORD CardHandle, BYTE MasBlk)
```

### 2.10.3.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasBlk | Master Control Block number (0-124) |

### 2.10.3.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.3.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0228 | Invalid Master Block Number |

## 2.10.4 PFB_AckMasGlbEvent

### 2.10.4.1 Description

Acknowledges a master global event so that the next master global event can be processed.

### 2.10.4.2 Prototype

```
BOOL WINAPI PFB_AckMasGlbEvent (DWORD CardHandle)
```

### 2.10.4.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |

### 2.10.4.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.4.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

## 2.10.5 PFB_Config2bf

### 2.10.5.1 Description

Configures the card's master services using a binary configuration file exported from the SIEMENS COM PROFIBUS Configuration tool (*.2BF).

### 2.10.5.2 Prototype

```
BOOL WINAPI PFB_Config2bf (DWORD CardHandle, TCHAR* sz2bfFileName)
```

### 2.10.5.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| sz2bfFileName | 2BF file name including its path |

### 2.10.5.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.5.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 021d | Invalid file name pointer |
| 2000 021e | Invalid configuration file |
| 2000 0254 | Taking card offline failed |
| 2000 0255 | Copy master configuration failed |
| 2000 0256 | Configuration 2bf shared RAM failed |
| 2000 0258 | Reading file error |
| 2000 03xx | Status Error (refer to definitions related to pfbStatus in Section 4.1.1.1). |

## 2.10.6 PFB_ConfigAbf

### 2.10.6.1 Description

Configures the card's master services using a binary configuration file exported from the SST PROFIBUS Configuration tool (*.BSS).

### 2.10.6.2 Prototype

```
BOOL WINAPI PFB_ConfigAbf (DWORD CardHandle, TCHAR* szBssFileName)
```

### 2.10.6.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| szBssFileName | BSS file name, including its path |

### 2.10.6.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.6.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation), card must be open with SS_WRITE flag |
| 2000 011a | Card access time-out |
| 2000 021d | Invalid file name pointer |
| 2000 021e | Invalid configuration file |
| 2000 0254 | Taking card off line failed |
| 2000 0255 | Copy master configuration failed |
| 2000 0256 | Configuration 2bf shared RAM failed |
| 2000 0258 | Reading file error |
| 2000 03xx | Status Error (refer to definitions related to pfbStatus in Section 4.1.1.1). |

## 2.10.7 PFB_GetMasCfg

### 2.10.7.1 Description

Gets the master block configuration parameters.

### 2.10.7.2 Prototype

```
BOOL WINAPI PFB_GetMasCfg (DWORD CardHandle, BYTE MasBlk, PFB_MAS_CFG* MasCfg).
For details, refer to PFB_MAS_CFG, in Section 4.4.1.1.
```

### 2.10.7.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasBlk | Master Control Block number (0-124) |
| MasCfg | Destination of Master block configuration parameters |

### 2.10.7.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.7.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer – MasCfg |
| 2000 011a | Card access timeout |
| 2000 0228 | Invalid Master Block Number |

## 2.10.8 PFB_GetMasCfgChk

### 2.10.8.1 Description

Gets the master configuration check data.

### 2.10.8.2 Prototype

```
BOOL WINAPI PFB_GetMasCfgChk (DWORD CardHandle, BYTE MasBlk, PFB_DP_CHK_CFG*
MasChkCfg). For details, refer to PFB DP CHK CFG, in Section 4.4.2.1.
```

### 2.10.8.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasBlk | Master Control Block number (0-124) |
| MasChkCfg | Destination of Master Configuration Check data |

### 2.10.8.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.8.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer – MasChkCfg |
| 2000 011a | Card access timeout |
| 2000 0228 | Invalid Master Block Number |

## 2.10.9 PFB_GetMasCntCfg

### 2.10.9.1 Description

Gets the master control configuration register.

### 2.10.9.2 Prototype

```
BOOL WINAPI PFB_GetMasCntCfg (DWORD CardHandle, BYTE MasBlk, BYTE* MasCntCfg)
```

### 2.10.9.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasBlk | Master Control Block number (0-124) |
| MasCntCfg | Destination of Master control configuration register |

### 2.10.9.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.9.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer – MasCntCfg |
| 2000 011a | Card access timeout |
| 2000 0228 | Invalid Master Block Number |

## 2.10.10 PFB_GetMasDiagInfo

### 2.10.10.1 Description

Gets the master diagnostic parameters.

### 2.10.10.2 Prototype

```
BOOL WINAPI PFB_GetMasDiagInfo (DWORD CardHandle, BYTE MasBlk,
PFB_DP_DIAG_INFO* MasDiag). For details, refer to PFB_DP_DIAG_INFO,
in Section 4.5.1.1.
```

### 2.10.10.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasBlk | Master Control Block number (0-124) |
| MasDiag | Destination of Master Diagnostic parameters |

### 2.10.10.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.10.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer – MasDiag |
| 2000 011a | Card access timeout |
| 2000 0228 | Invalid Master Block Number |

## 2.10.11 PFB_GetMasGlbCfg

### 2.10.11.1 Description

Gets the master global configuration parameters.

### 2.10.11.2 Prototype

```
BOOL WINAPI PFB_GetMasGlbCfg (DWORD CardHandle, PFB_MAS_GLB_CFG* MasGlbCfg).
For details, refer to PFB_MAS_GLB_CFG, in Section 4.3.1.1.
```

### 2.10.11.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasGlbCfg | Destination of Master Global Configuration parameters |

### 2.10.11.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.11.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer – MasGlbCfg |
| 2000 011a | Card access timeout |

## 2.10.12 PFB_GetMasGlbSts

### 2.10.12.1 Description

Gets the master global status parameters.

### 2.10.12.2 Prototype

```
BOOL WINAPI PFB_GetMasGlbSts (DWORD CardHandle, BYTE* MasGlbSts)
```

### 2.10.12.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasGlbSts | Destination of Master Global Status parameters |

### 2.10.12.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.12.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer – MasGlbSts |
| 2000 011a | Card access timeout |

## 2.10.13 PFB_GetMasPage

### 2.10.13.1 Description

Gets the master page number.

### 2.10.13.2 Prototype

```
BOOL WINAPI PFB_GetMasPage (DWORD CardHandle, BYTE* MasPage)
```

### 2.10.13.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasPage | Destination of Master page number |

### 2.10.13.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.13.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - MasPage |
| 2000 011a | Card access timeout |

## 2.10.14 PFB_GetMasParmData

### 2.10.14.1 Description

Gets the master parameter data.

### 2.10.14.2 Prototype

```
BOOL WINAPI PFB_GetMasParmData (DWORD CardHandle, BYTE MasBlk,
PFB_DP_PARM_DATA* MasParm). For details, refer to PFB_DP_PARM_DATA,
in Section 4.5.2.1.
```

### 2.10.14.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasBlk | Master Control Block number (0-124) |
| MasParm | Destination of Master Diagnostic parameters |

### 2.10.14.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.14.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - MasParm |
| 2000 011a | Card access timeout |
| 2000 0228 | Invalid Master Block Number |

## 2.10.15 PFB_GetMasRxData

### 2.10.15.1 Description

Gets the master receive data.

### 2.10.15.2 Prototype

```
BOOL WINAPI PFB_GetMasRxData (DWORD CardHandle, BYTE MasBlk, BYTE Ofs, BYTE
Len, BYTE* DataBuf)
```

### 2.10.15.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasBlk | Master Control Block number (0-124) |
| Ofs | Offset of the RX Data |
| Len | Length of the data to be read |
| DataBuf | Destination of Master RX Data |

### 2.10.15.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.15.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer – DataBuf |
| 2000 011a | Card access timeout |
| 2000 0228 | Invalid Master Block Number |
| 2000 0234 | Receive data not configured |
| 2000 0236 | Invalid relative offset (Ofs >= RxDataLen) |
| 2000 0237 | Invalid relative length (Len > RxDataLen - Ofs) |

## 2.10.16 PFB_GetMasStatusTable

### 2.10.16.1 Description

Gets the master status table.

### 2.10.16.2 Prototype

```
BOOL WINAPI PFB_GetMasStatusTable (DWORD CardHandle, WORD* MasStsTab)
```

### 2.10.16.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasStsTab | Destination of Master Status Table |

### 2.10.16.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.16.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer – MasStsTab |
| 2000 011a | Card access timeout |

## 2.10.17 PFB_GetMasSts

### 2.10.17.1 Description

Gets the master status parameters.

### 2.10.17.2 Prototype

```
BOOL WINAPI PFB_GetMasSts (DWORD CardHandle, BYTE MasBlk, PFB_MAS_STS* MasSts).
For details, refer to PFB_MAS_STS, in Section 4.3.2.1.
```

### 2.10.17.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasBlk | Master Control Block number (0-124) |
| MasSts | Destination of Master Status parameters |

### 2.10.17.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.17.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer – MasSts |
| 2000 011a | Card access timeout |
| 2000 0228 | Invalid Master Block Number |

## 2.10.18 PFB_GetMasTxData

### 2.10.18.1 Description

Gets the master transmit data.

### 2.10.18.2 Prototype

```
BOOL WINAPI PFB_GetMasTxData (DWORD CardHandle, BYTE MasBlk, BYTE Ofs, BYTE
Len, BYTE* DataBuf)
```

### 2.10.18.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasBlk | Master Control Block number (0-124) |
| Ofs | Offset of the TX Data |
| Len | Length of the data to be read |
| DataBuf | Destination of Master TX Data |

### 2.10.18.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.18.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer – DataBuf |
| 2000 011a | Card access timeout |
| 2000 0228 | Invalid Master Block Number |
| 2000 0238 | Invalid relative offset (Ofs >= TxDataLen) |
| 2000 0239 | Invalid relative length (Len >= TxDataLen - Ofs) |
| 2000 023a | Transmit data not configured (TxDataLen = 0) |

## 2.10.19 PFB_PutMasCfg

### 2.10.19.1 Description

Writes the master configuration block parameters into the card's Master Control page.

### 2.10.19.2 Prototype

```
BOOL WINAPI PFB_PutMasCfg (DWORD CardHandle, BYTE MasBlk, PFB_MAS_CFG* MasCfg).
For details, refer to PFB_MAS_CFG, in Section 4.4.1.1.
```

### 2.10.19.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasBlk | Master Control Block number (0-124) |
| MasCfg | Source of Master Configuration Block parameters |

### 2.10.19.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.19.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0228 | Invalid Master Block Number |
| 2000 0229 | Invalid Station Number (0-126) |
| 2000 022a | Invalid Master Configuration Control register (refer to definitions related to masCntCfg, in Section 4.4.1.1). |
| 2000 022b | Invalid Master RX length (0-244) |
| 2000 022c | Invalid Master TX length (0-244) |
| 2000 022d | Invalid RX offset (0-3FF8h - 8 byte boundary) |
| 2000 022e | Invalid TX offset (0-3FF8h - 8 byte boundary) |
| 2000 04xx | Not Offline state - cannot configure<br>(xx contains current command) |

## 2.10.20 PFB_PutMasCfgChk

### 2.10.20.1 Description

Writes the master configuration check data.

### 2.10.20.2 Prototype

```
BOOL WINAPI PFB_PutMasCfgChk (DWORD CardHandle, BYTE MasBlk, PFB_DP_CHK_CFG*
MasChkCfg). For details, refer to PFB DP CHK CFG, in Section 4.4.2.1.
```

### 2.10.20.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasBlk | Master Control Block number (0-124) |
| MasChkCfg | Source of Master Configuration check data |

### 2.10.20.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.20.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0228 | Invalid Master Block Number |
| 2000 0233 | Invalid Master Check length (0-30) |
| 2000 0259 | No more resources for extended check data available |
| 2000 04xx | Not Offline state - cannot configure<br>(xx contains current command) |

## 2.10.21 PFB_PutMasCntCfg

### 2.10.21.1 Description

Writes the master control configuration register.

### 2.10.21.2 Prototype

```
BOOL WINAPI PFB_PutMasCntCfg (DWORD CardHandle, BYTE MasBlk, BYTE MasCntCfg)
```

### 2.10.21.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasBlk | Master Control Block number (0-124) |
| MasCntCfg | Source of Master Control Configuration register |

### 2.10.21.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.21.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0228 | Invalid Master Block Number |
| 2000 022a | Invalid Master Configuration Control register (refer to definitions related to masCntCfg, in Section 4.4.1.1). |

## 2.10.22 PFB_PutMasGlbCfg

### 2.10.22.1 Description

Writes the master global configuration parameters.

### 2.10.22.2 Prototype

```
BOOL WINAPI PFB_PutMasGlbCfg (DWORD CardHandle, PFB_MAS_GLB_CFG* MasGlbCfg).
For details, refer to PFB_MAS_GLB_CFG, in Section 4.3.1.1.
```

### 2.10.22.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasGlbCfg | Source of Master Global Configuration parameters |

### 2.10.22.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.22.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0224 | Master already configured |
| 2000 0225 | Invalid Global Master Control Configuration register (refer to definitions related to pfbmasCntrlCfg, in Section 4.3.1.1). |
| 2000 0226 | Invalid Min Cycle Time (2-255 in 100us) |
| 2000 0227 | Invalid Max Cycle Time (1-65535 in 10ms) |
| 2000 04xx | Not Offline state - cannot configure<br>(xx contains current command) |

## 2.10.23 PFB_PutMasGlbCntrlCfg

### 2.10.23.1 Description

Writes the master global control configuration register. Sets various options for the DP Master.

### 2.10.23.2 Prototype

```
BOOL PFB_PutMasGlbCntrlCfg (DWORD CardHandle, BYTE MasGlbCntrlCfg)
```

### 2.10.23.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasGlbCntrlCfg | Source of master global configuration register (see bit definitions for that register in pfbMasCntrlCfg register of PFB_MAS_GLB_CFG structure) |

### 2.10.23.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.23.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 011a | Card access timeout |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 0102 | Invalid CardHandle |
| 2000 0225 | Invalid Global Master Control Configuration register (refer to definitions related to pfbmasCntrlCfg, in Section 4.3.1.1). |

## 2.10.24 PFB_PutMasParmData

### 2.10.24.1 Description

Writes the master parameter data.

### 2.10.24.2 Prototype

```
BOOL WINAPI PFB_PutMasParmData (DWORD CardHandle, BYTE MasBlk,
PFB_DP_PARM_DATA* MasParm). For details, refer to PFB DP PARM DATA,
in Section 4.5.2.1.
```

### 2.10.24.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasBlk | Number of a master block (0-124) |
| MasGlbCfg | Source of Master Parameter data |

### 2.10.24.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.24.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0228 | Invalid Master Block Number |
| 2000 022f | Invalid Master Parameter length (0-23) |
| 2000 0230 | Invalid Master Watch Dog Factor 1 (1-255) |
| 2000 0231 | Invalid Master Watch Dog Factor 2 (1-255) |
| 2000 0232 | Invalid Master Ready Time (1-255) |
| 2000 0259 | No more resources for extended parameters available |
| 2000 04xx | Not Offline state - cannot configure<br>(xx contains current command) |

## 2.10.25 PFB_PutMasTxData

### 2.10.25.1 Description

Writes the master transmit data.

### 2.10.25.2 Prototype

```
BOOL WINAPI PFB_PutMasTxData (DWORD CardHandle, BYTE MasBlk, BYTE Ofs, BYTE
Len, BYTE* DataBuf)
```

### 2.10.25.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| MasBlk | Master Control Block number (0-124) |
| Offset | Offset of the TX Data |
| Length | Length of the data to be written |
| DataBuf | Source of Master TX Data |

### 2.10.25.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.10.25.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0228 | Invalid Master Block Number |
| 2000 0238 | Invalid relative offset (Ofs >= TxDataLen) |
| 2000 0239 | Invalid relative length (Len >= TxDataLen - Ofs) |

# 2.11 DP Slave API

## 2.11.1 PFB_AckSlvDiagEvent

### 2.11.1.1 Description

Acknowledges a slave diagnostic event so that the next slave diagnostic event can be processed.

### 2.11.1.2 Prototype

```
BOOL WINAPI PFB_AckSlvDiagEvent (DWORD CardHandle)
```

### 2.11.1.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |

### 2.11.1.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.11.1.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

## 2.11.2 PFB_AckSlvError

### 2.11.2.1 Description

Acknowledges a slave error so that the next slave error can be processed.

### 2.11.2.2 Prototype

```
BOOL WINAPI PFB_AckSlvError (DWORD CardHandle)
```

### 2.11.2.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |

### 2.11.2.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.11.2.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

## 2.11.3 PFB_AckSlvEvent

### 2.11.3.1 Description

Acknowledges a slave event so that the next slave event can be processed.

### 2.11.3.2 Prototype

```
BOOL WINAPI PFB_AckSlvEvent (DWORD CardHandle)
```

### 2.11.3.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |

### 2.11.3.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.11.3.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

## 2.11.4 PFB_GetSlvCfg

### 2.11.4.1 Description

Gets the slave configuration table.

### 2.11.4.2 Prototype

```
BOOL WINAPI PFB_GetSlvCfg (DWORD CardHandle, PFB_SLV_CFG* SlvCfg).
For details, refer to PFB_SLV_CFG, in Section 4.10.1.1.
```

### 2.11.4.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| SlvCfg | Destination of Slave Configuration Table |

### 2.11.4.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.11.4.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - SlvCfg |
| 2000 011a | Card access timeout |

## 2.11.5 PFB_GetSlvCfgChk

### 2.11.5.1 Description

Gets slave configuration check data.

### 2.11.5.2 Prototype

```
BOOL WINAPI PFB_GetSlvCfgChk (DWORD CardHandle, PFB_DP_CHK_CFG* SlvChkCfg).
For details, refer to PFB_DP_CHK_CFG, in Section 4.4.2.1.
```

### 2.11.5.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| SlvChkCfg | Destination of Slave Configuration Check parameters |

### 2.11.5.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.11.5.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - SlvChkCfg |
| 2000 011a | Card access timeout |

## 2.11.6 PFB_GetSlvDiagInfo

### 2.11.6.1 Description

Gets the slave diagnostic parameters.

### 2.11.6.2 Prototype

```
BOOL WINAPI PFB_GetSlvDiagInfo (DWORD CardHandle, PFB_DP_DIAG_INFO* SlvDiag).
For details, refer to PFB_DP_DIAG_INFO, in Section 4.5.1.1.
```

### 2.11.6.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| SlvDiag | Destination of Slave Diagnostic parameters |

### 2.11.6.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.11.6.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - SlvDiag |
| 2000 011a | Card access timeout |

## 2.11.7 PFB_GetSlvParmData

### 2.11.7.1 Description

Gets slave parameter's data.

### 2.11.7.2 Prototype

```
BOOL WINAPI PFB_GetSlvParmData (DWORD CardHandle, PFB_DP_PARM_DATA* SlvParm).
For details, refer to PFB_DP_PARM_DATA, in Section 4.5.2.1.
```

### 2.11.7.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| SlvParm | Destination of Slave Parameter data |

### 2.11.7.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.11.7.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - SlvParm |
| 2000 011a | Card access timeout |

## 2.11.8 PFB_GetSlvRxData

### 2.11.8.1 Description

Gets the slave's received data.

### 2.11.8.2 Prototype

```
BOOL WINAPI PFB_GetSlvRxData (DWORD CardHandle, BYTE Ofs, BYTE Len, BYTE*
DataBuf)
```

### 2.11.8.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Ofs | Offset within configured data (0-243) |
| Len | Length of data (1-244) |
| DataBuf | Destination of Slave received data |

### 2.11.8.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.11.8.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - DataBuf |
| 2000 011a | Card access timeout |
| 2000 0236 | Invalid relative offset (Ofs >= RxDataLen) |
| 2000 0237 | Invalid relative length (Len > RxDataLen - Ofs) |

## 2.11.9 PFB_GetSlvStatus

### 2.11.9.1 Description

Gets a slave's status parameters.

### 2.11.9.2 Prototype

```
BOOL WINAPI PFB_GetSlvStatus (DWORD CardHandle, PFB_SLV_STS* SlvSts).
For details, refer to PFB_SLV_STS, in Section 4.11.1.1.
```

### 2.11.9.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| SlvSts | Destination of Slave Status parameters |

### 2.11.9.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.11.9.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - SlvSts |
| 2000 011a | Card access timeout |

## 2.11.10 PFB_GetSlvTxData

### 2.11.10.1 Description

Gets a slave's transmitted data.

### 2.11.10.2 Prototype

```
BOOL WINAPI PFB_GetSlvTxData (DWORD CardHandle, BYTE Ofs, BYTE Len, BYTE*
DataBuf)
```

### 2.11.10.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Ofs | Offset within configured data (0-243) |
| Len | Length of data (1-244) |
| DataBuf | Destination of Slave transmitted data |

### 2.11.10.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.11.10.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - DataBuf |
| 2000 011a | Card access timeout |
| 2000 0238 | Invalid relative offset (Ofs >= TxDataLen) |
| 2000 0239 | Invalid relative length (Len >= TxDataLen - Ofs) |

## 2.11.11 PFB_PutSlvCfg

### 2.11.11.1 Description

Writes the slave configuration parameters.

### 2.11.11.2 Prototype

```
BOOL WINAPI PFB_PutSlvCfg (DWORD CardHandle, PFB_SLV_CFG* SlvCfg).
For details, refer to PFB_SLV_CFG, in Section 4.10.1.1.
```

### 2.11.11.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| SlvCfg | Source of Slave Configuration parameters |

### 2.11.11.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.11.11.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0220 | Invalid Control Configuration register (refer to definitions related to slvCntlCfg, in Section 4.10.1.1). |
| 2000 0221 | Invalid slave receive length (0-244) |
| 2000 0222 | Invalid slave transmit length (0-244) |
| 2000 04xx | Not Offline state - cannot configure<br>(xx contains current command) |

## 2.11.12 PFB_PutSlvCntCfg

### 2.11.12.1 Description

Writes the slave control configuration register.

### 2.11.12.2 Prototype

```
BOOL PFB_PutSlvCntCfg (DWORD CardHandle, WORD SlvCntCfg)
```

### 2.11.12.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| SlvCntCfg | Source of slave control configuration register |

### 2.11.12.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.11.12.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0220 | Invalid Control Configuration register (refer to definitions related to slvCntlCfg, in Section 4.10.1.1). |

## 2.11.13 PFB_PutSlvDiagInfo

### 2.11.13.1 Description

Writes the slave diagnostic parameters.

### 2.11.13.2 Prototype

```
BOOL WINAPI PFB_PutSlvDiagInfo (DWORD CardHandle, PFB_DP_DIAG_INFO* SlvDiag).
For details, refer to PFB_DP_DIAG_INFO, in Section 4.5.1.1.
```

### 2.11.13.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| SlvDiag | Destination of Slave Diagnostic parameters |

### 2.11.13.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.11.13.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0223 | Invalid slave diagnostic length (0-26) |
| 2000 04xx | Not Offline state - cannot configure<br>(xx contains current command) |

## 2.11.14 PFB_PutSlvTxData

### 2.11.14.1 Description

Writes the slave transmit data.

### 2.11.14.2 Prototype

```
BOOL WINAPI PFB_PutSlvTxData (DWORD CardHandle, BYTE Ofs, BYTE Len, BYTE*
DataBuf)
```

### 2.11.14.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Ofs | Offset within configured data (0-243) |
| Len | Length of data (1-244) |
| DataBuf | Source of Slave transmitted data |

### 2.11.14.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.11.14.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0238 | Invalid relative offset (Ofs >= TxDataLen) |
| 2000 0239 | Invalid relative length (Len >= TxDataLen - Ofs) |

# 2.12 Layer 2 Message API

## 2.12.1 PFB_AckL2MsgError

### 2.12.1.1 Description

Acknowledges a Layer 2 message error so that the next message error can be processed.

### 2.12.1.2 Prototype

```
BOOL WINAPI PFB_AckL2MsgError (DWORD CardHandle, BYTE BlkNum)
```

### 2.12.1.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |

### 2.12.1.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.1.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |

## 2.12.2 PFB_AckL2MsgEvent

### 2.12.2.1 Description

Acknowledges a Layer 2 message event so that the next message event can be processed.

### 2.12.2.2 Prototype

```
BOOL WINAPI PFB_AckL2MsgEvent (DWORD CardHandle, BYTE BlkNum)
```

### 2.12.2.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |

### 2.12.2.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.2.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |

## 2.12.3 PFB_ActivateL2Msg

### 2.12.3.1 Description

Activates (triggers) a Layer 2 message. The message must be in the LAY2M_STE_DONE or the LAY2M_STE_IN_CONFIGURE state. Set the message state to LAY2M_STE_ENABLE.

### 2.12.3.2 Prototype

```
BOOL WINAPI PFB_ActivateL2Msg (DWORD CardHandle, BYTE BlkNum)
```

### 2.12.3.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |

### 2.12.3.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.3.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |
| 2000 0244 | Invalid Message state (LAY2M_STE_DONE or LAY2M_STE_IN_CONFIGURE) |

## 2.12.4 PFB_CloseL2MsgBlk

### 2.12.4.1 Description

Closes the previously opened message block.

### 2.12.4.2 Prototype

```
BOOL WINAPI PFB_CloseL2MsgBlk (DWORD CardHandle, BYTE BlkNum)
```

### 2.12.4.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |

### 2.12.4.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.4.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |
| 2000 0245 | Message already closed |
| 2000 0246 | Message not processed yet |

## 2.12.5 PFB_GetL2MsgCfg

### 2.12.5.1 Description

Gets a Layer 2 message control block.

### 2.12.5.2 Prototype

```
BOOL WINAPI PFB_GetL2MsgCfg (DWORD CardHandle, BYTE BlkNum, PFB_L2MSG_CFG*
L2MsgCfg). For details, refer to PFB L2MSG CFG, in Section 4.6.1.1.
```

### 2.12.5.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |
| L2MsgCfg | Destination of Layer 2 message block |

### 2.12.5.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.5.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - L2MsgCfg |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |

## 2.12.6 PFB_GetL2MsgCntCfg

### 2.12.6.1 Description

Gets a Layer 2 message control configuration register.

### 2.12.6.2 Prototype

```
BOOL PFB_GetL2MsgCntCfg (DWORD CardHandle, BYTE BlkNum, BYTE* L2MsgCntCfg)
```

### 2.12.6.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |
| L2MsgCntCfg | Destination of message control configuration register |

### 2.12.6.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.6.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - L2MsgCntCfg |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |

## 2.12.7 PFB_GetL2MsgInfo

### 2.12.7.1 Description

Gets a Layer 2 message information block.

### 2.12.7.2 Prototype

```
BOOL WINAPI PFB_GetL2MsgInfo (DWORD CardHandle, BYTE BlkNum, PFB_L2MSG_TX*
L2MsgTx). For details, refer to PFB L2MSG TX, in Section 4.7.1.1.
```

### 2.12.7.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |
| L2MsgTx | Destination of Layer 2 message information block |

### 2.12.7.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.7.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - L2MsgTx |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |

## 2.12.8 PFB_GetL2MsgMaxRxTxLen

### 2.12.8.1 Description

Gets a Layer 2 message maximum RX and TX length that's configured on the card.

### 2.12.8.2 Prototype

```
BOOL PFB_GetL2MsgMaxRxTxLen (DWORD CardHandle, BYTE BlkNum, BYTE* MaxRxLen,
BYTE* MaxTxLen)
```

### 2.12.8.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |
| MaxRxLen | Destination of message max. RX length |
| MaxTxLen | Destination of message max. TX length |

### 2.12.8.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.8.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - MaxRxLen and/or MaxTxLen |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |

## 2.12.9 PFB_GetL2MsgReply

### 2.12.9.1 Description

Gets a Layer 2 message reply.

### 2.12.9.2 Prototype

```
BOOL WINAPI PFB_GetL2MsgReply (DWORD CardHandle, BYTE BlkNum, PFB_L2MSG_STS*
L2MsgSts, BYTE* RxData, DWORD TimeOut). For details, refer to PFB_L2MSG_STS,
in Section 4.6.2.1.
```

### 2.12.9.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |
| L2MsgSts | Destination of Layer 2 message status parameters |
| RxData | Destination of data to be read |
| TimeOut | Time allowed for message reply |

### 2.12.9.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.9.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - L2MsgSts and/or RxData |
| 2000 011a | Card access timeout |
| 2000 0257 | Message replay timeout |
| 2000 023b | Invalid Message block number (0-127) |

## 2.12.10 PFB_GetL2MsgRxData

### 2.12.10.1 Description

Gets Layer 2 message RX data.

### 2.12.10.2 Prototype

```
BOOL WINAPI PFB_GetL2MsgRxData (DWORD CardHandle, BYTE BlkNum, BYTE Ofs, BYTE
Len, BYTE* DataBuf)
```

### 2.12.10.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |
| Ofs | Offset of the RX Data |
| Len | Length of the data to be read |
| DataBuf | Destination of Message RX Data |

### 2.12.10.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.10.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - DataBuf |
| 2000 011a | Card access timeout |
| 2000 0235 | Receive data not available |
| 2000 0236 | Invalid relative offset (Ofs >= RxDataLen) |
| 2000 0237 | Invalid relative length (Len > RxDataLen - Ofs) |
| 2000 023b | Invalid Message block number (0-127) |

## 2.12.11 PFB_GetL2MsgState

### 2.12.11.1 Description

Gets a Layer 2 message state.

### 2.12.11.2 Prototype

```
BOOL WINAPI PFB_GetL2MsgState (DWORD CardHandle, BYTE BlkNum, BYTE* L2MsgState)
```

### 2.12.11.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |
| L2MsgState | Destination of Layer 2 message state |

### 2.12.11.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.11.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - L2MsgState |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |

## 2.12.12 PFB_GetL2MsgSts

### 2.12.12.1 Description

Gets Layer 2 message status parameters.

### 2.12.12.2 Prototype

```
BOOL WINAPI PFB_GetL2MsgSts (DWORD CardHandle, BYTE BlkNum, PFB_L2MSG_STS*
L2MsgSts). For details, refer to PFB L2MSG STS, in Section 4.6.2.1.
```

### 2.12.12.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |
| L2MsgSts | Destination of Layer 2 message status parameters |

### 2.12.12.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.12.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - L2MsgSts |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |

## 2.12.13 PFB_GetL2MsgTxData

### 2.12.13.1 Description

Gets Layer 2 message TX data.

### 2.12.13.2 Prototype

```
BOOL WINAPI PFB_GetL2MsgTxData (DWORD CardHandle, BYTE BlkNum, BYTE Ofs, BYTE
Len, BYTE* DataBuf)
```

### 2.12.13.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |
| Ofs | Offset of the TX Data |
| Len | Length of the data to be read |
| DataBuf | Destination of Message TX Data |

### 2.12.13.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.13.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - DataBuf |
| 2000 011a | Card access timeout |
| 2000 0238 | Invalid relative offset (Ofs >= TxDataLen) |
| 2000 0239 | Invalid relative length (Len >= TxDataLen - Ofs) |
| 2000 023a | Transmit data not configured (TxDataLen = 0) |
| 2000 023b | Invalid Message block number (0-127) |

## 2.12.14 PFB_InitL2MsgBlk

### 2.12.14.1 Description

Initializes a Layer 2 message control block.

### 2.12.14.2 Prototype

```
BOOL WINAPI PFB_InitL2MsgBlk (DWORD CardHandle, BYTE BlkNum, BYTE MaxRxLen,
BYTE MaxTxLen)
```

### 2.12.14.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |
| MaxRxLen | Maximum length of received data |
| MaxTxLen | Maximum length of transmit data |

### 2.12.14.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.14.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |
| 2000 023c | Invalid Message Receive Length (0-244) |
| 2000 023d | Invalid Message Transmit Length (0-244) |
| 2000 04xx | Not Offline state - cannot configure<br>(xx contains current command) |

## 2.12.15 PFB_InitL2MsgGlb

### 2.12.15.1 Description

Initializes the Layer 2 message global control register. This function enables Message Services on the card and updates the Message Disable LED bit.

### 2.12.15.2 Prototype

```
BOOL WINAPI PFB_InitL2MsgGlb (DWORD CardHandle, BOOL DisLed)
```

### 2.12.15.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| DisLed | TRUE - disable LED, FALSE - enable LED |

### 2.12.15.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.15.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 04xx | Not Offline state - cannot configure<br>(xx contains current command) |

## 2.12.16 PFB_OpenL2MsgBlk

### 2.12.16.1 Description

Opens a Layer 2 message control block.

### 2.12.16.2 Prototype

```
BOOL WINAPI PFB_OpenL2MsgBlk (DWORD CardHandle, BYTE BlkNum)
```

### 2.12.16.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |

### 2.12.16.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.16.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |
| 2000 0242 | Message Block busy |
| 2000 0243 | Message Block used before |

# 2.12.17 PFB_PutL2MsgCfg

## 2.12.17.1 Description

Writes a Layer 2 Message Configuration block.

## 2.12.17.2 Prototype

```
BOOL WINAPI PFB_PutL2MsgCfg (DWORD CardHandle, BYTE BlkNum, PFB_L2MSG_CFG*
L2MsgCfg). For details, refer to PFB L2MSG CFG, in Section 4.6.1.1.
```

## 2.12.17.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |
| L2MsgCfg | Source of Layer 2 Message Control Block Data |

## 2.12.17.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

## 2.12.17.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |
| 2000 023e | Invalid Message Control Configuration register (refer to definitions related to lay2mCntCfg, in Section 4.6.1.1). |
| 2000 023f | Invalid Update Time (periodic updtme * 1ms (1-16380)) |
| 2000 0240 | Invalid Error Time (retry per msg. on error after this time * 1ms (1-16380)) |

## 2.12.18 PFB_PutL2MsgCntCfg

### 2.12.18.1 Description

Writes a Layer 2 Message control configuration register.

### 2.12.18.2 Prototype

```
BOOL PFB_PutL2MsgCntCfg (DWORD CardHandle, BYTE BlkNum, BYTE L2MsgCntCfg)
```

### 2.12.18.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |
| L2MsgCntCfg | Source of Layer 2 Message control configuration register |

### 2.12.18.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.18.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |
| 2000 023e | Invalid Message Control Configuration register (refer to definitions related to lay2mCntCfg, in Section 4.6.1.1). |

## 2.12.19 PFB_PutL2MsgInfo

### 2.12.19.1 Description

Writes the Layer 2 message information (L2MsgTx) structure on the card. The message must be in the LAY2M_STE_DONE or LAY2M_STE_IN_CONFIGURE state. Set the state of the message to LAY2M_STE_ENABLE.

### 2.12.19.2 Prototype

```
BOOL WINAPI PFB_PutL2MsgInfo (DWORD CardHandle, BYTE BlkNum, PFB_L2MSG_TX*
L2MsgTx). For details, refer to PFB_L2MSG_TX, in Section 4.7.1.1.
```

### 2.12.19.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |
| L2MsgTx | Source of Layer 2 message TX parameters |

### 2.12.19.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.19.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |
| 2000 0244 | Invalid Message state (LAY2M_STE_DONE or LAY2M_STE_IN_CONFIGURE) |
| 2000 0247 | Invalid Destination Station (0-126) |
| 2000 0248 | Invalid Destination SAP (0-63, 255-disable) |
| 2000 0249 | Invalid Source SAP (0-63, 255-disable) |
| 2000 024a | Invalid Frame Control (refer to definitions related to lay2mFrmCntrl, in Section 4.7.1.1). |
| 2000 024b | Invalid Message Transmit Length (0-244) |

## 2.12.20 PFB_PutL2MsgTxData

### 2.12.20.1 Description

Writes the Layer 2 message transmit data.

### 2.12.20.2 Prototype

```
BOOL WINAPI PFB_PutL2MsgTxData (DWORD CardHandle, BYTE BlkNum, BYTE Ofs, BYTE
Len, BYTE* DataBuf)
```

### 2.12.20.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |
| Ofs | Offset of the TX Data |
| Len | Length of the data to be written |
| DataBuf | Source of Message TX Data |

### 2.12.20.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.20.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0238 | Invalid relative offset (Ofs >= TxDataLen) |
| 2000 0239 | Invalid relative length (Len >= TxDataLen - Ofs) |
| 2000 023b | Invalid Message block number (0-127) |

## 2.12.21 PFB_SendL2Msg

### 2.12.21.1 Description

Sends a Layer 2 message.

### 2.12.21.2 Prototype

```
BOOL WINAPI PFB_SendL2Msg (DWORD CardHandle, BYTE BlkNum, PFB_L2MSG_TX*
L2MsgTx, BYTE* TxData). For details, refer to PFB_L2MSG_TX, in Section 4.7.1.1.
```

### 2.12.21.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |
| L2MsgTx | Source of Layer 2 message TX parameters |
| TxData | Source of Data to be transmitted |

### 2.12.21.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.21.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |
| 2000 0244 | Invalid Message state (LAY2M_STE_DONE or LAY2M_STE_IN_CONFIGURE) |
| 2000 0247 | Invalid Destination Station (0-126) |
| 2000 0248 | Invalid Destination SAP (0-63, 255-disable) |
| 2000 0249 | Invalid Source SAP (0-63, 255-disable) |
| 2000 024a | Invalid Frame Control (refer to definitions related to lay2mFrmCntrl, in Section 4.7.1.1). |
| 2000 024b | Invalid Message Transmit Length (0-244) |

## 2.12.22 PFB_SendL2MsgWaitForReply

### 2.12.22.1 Description

Sends a Layer 2 message and waits for a reply.

### 2.12.22.2 Prototype

```
BOOL WINAPI PFB_SendL2MsgWaitForReply (DWORD CardHandle, BYTE BlkNum,
PFB_L2MSG_TX* L2MsgTx, BYTE* TxData, PFB_L2MSG_STS* L2MsgSts, BYTE* RxData,
DWORD TimeOut). For details, refer to PFB L2MSG TX in Section 4.7.1.1,
and PFB L2MSG STS, in Section 4.6.2.1.
```

### 2.12.22.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |
| L2MsgTx | Source of Layer 2 message TX parameters |
| TxData | Source of Data to be transmitted |
| L2MsgSts | Destination of Layer 2 message status |
| RxData | Destination of received data |
| TimeOut | Time allowed for message reply |

### 2.12.22.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.22.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 0114 | Invalid pointer - L2MsgSts and/or RxData |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |
| 2000 0244 | Invalid Message state (LAY2M_STE_DONE or LAY2M_STE_IN_CONFIGURE) |
| 2000 0247 | Invalid Destination Station (0-126) |
| 2000 0248 | Invalid Destination SAP (0-63, 255-disable) |
| 2000 0249 | Invalid Source SAP (0-63, 255-disable) |
| 2000 024a | Invalid Frame Control (refer to definitions related to lay2mFrmCntrl, in Section 4.7.1.1). |
| 2000 024b | Invalid Message Transmit Length (0-244) |
| 2000 0257 | Message replay timeout |

## 2.12.23 PFB_TrigL2Msg

### 2.12.23.1 Description

Triggers a Layer 2 message and writes the PFB_L2MSG_TX structure contents to the card.

### 2.12.23.2 Prototype

```
BOOL WINAPI PFB_TrigL2Msg (DWORD CardHandle, BYTE BlkNum, PFB_L2MSG_TX*
L2MsgTx). For details, refer to PFB_L2MSG_TX, in Section 4.7.1.1.
```

### 2.12.23.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | Message block number (0-127) |
| L2MsgTx | Source of Layer 2 message TX parameters |

### 2.12.23.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.12.23.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 023b | Invalid Message block number (0-127) |
| 2000 0244 | Invalid Message state (LAY2M_STE_DONE or LAY2M_STE_IN_CONFIGURE) |
| 2000 0247 | Invalid Destination Station (0-126) |
| 2000 0248 | Invalid Destination SAP (0-63, 255-disable) |
| 2000 0249 | Invalid Source SAP (0-63, 255-disable) |
| 2000 024a | Invalid Frame Control (refer to definitions related to lay2mFrmCntrl, in Section 4.7.1.1). |
| 2000 024b | Invalid Message Transmit Length (0-244) |

# 2.13 Layer 2 SAP API

## 2.13.1 PFB_AckL2SapError

### 2.13.1.1 Description

Acknowledges a Layer 2 SAP error so that the next SAP error can be processed.

### 2.13.1.2 Prototype

```
BOOL WINAPI PFB_AckL2SapError (DWORD CardHandle, BYTE BlkNum)
```

### 2.13.1.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | SAP block number (0-63) |

### 2.13.1.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.13.1.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0241 | Invalid SAP block number (0-63) |

## 2.13.2 PFB_AckL2SapEvent

### 2.13.2.1 Description

Acknowledges a Layer 2 SAP event so that the next SAP event can be processed.

### 2.13.2.2 Prototype

```
BOOL WINAPI PFB_AckL2SapEvent (DWORD CardHandle, BYTE BlkNum)
```

### 2.13.2.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | SAP block number (0-63) |

### 2.13.2.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.13.2.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0241 | Invalid SAP block number (0-63) |

## 2.13.3 PFB_GetL2SapCfg

### 2.13.3.1 Description

Gets a SAP control block for Layer 2.

### 2.13.3.2 Prototype

```
BOOL WINAPI PFB_GetL2SapCfg (DWORD CardHandle, BYTE BlkNum, PFB_L2SAP_CFG*
L2SapCfg). For details, refer to PFB L2SAP CFG, in Section 4.8.1.1.
```

### 2.13.3.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | SAP block number (0-63) |
| L2SapCfg | Destination of Layer 2 SAP block |

### 2.13.3.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.13.3.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - L2SapCfg |
| 2000 011a | Card access timeout |
| 2000 0241 | Invalid SAP block number (0-63) |

## 2.13.4 PFB_GetL2SapCntCfg

### 2.13.4.1 Description

Gets a Layer 2 SAP control configuration register.

### 2.13.4.2 Prototype

```
BOOL PFB_GetL2SapCntCfg (DWORD CardHandle, BYTE BlkNum, WORD* L2SapCntCfg)
```

### 2.13.4.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | SAP block number (0-63) |
| L2SapCntCfg | Destination of SAP control configuration register |

### 2.13.4.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.13.4.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - L2SapCntCfg |
| 2000 011a | Card access timeout |
| 2000 0241 | Invalid SAP block number (0-63) |

## 2.13.5 PFB_GetL2SapMaxRxTxLen

### 2.13.5.1 Description

Gets the Layer 2 SAP maximum RX and TX length configured.

### 2.13.5.2 Prototype

```
BOOL PFB_GetL2SapMaxRxTxLen (DWORD CardHandle, BYTE BlkNum, BYTE* MaxRxLen,
BYTE* MaxTxLen)
```

### 2.13.5.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | SAP block number (0-63) |
| MaxRxLen | Destination of SAP max. RX length |
| MaxTxLen | Destination of SAP max. TX length |

### 2.13.5.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.13.5.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - MaxRxLen and/or MaxTxLen |
| 2000 011a | Card access timeout |
| 2000 0241 | Invalid SAP block number (0-63) |

## 2.13.6 PFB_GetL2SapRequest

### 2.13.6.1 Description

Gets the Layer 2 SAP request data.

### 2.13.6.2 Prototype

```
BOOL WINAPI PFB_GetL2SapRequest (DWORD CardHandle, BYTE BlkNum, PFB_L2SAP_STS*
L2SapSts, BYTE* RxData). For details, refer to PFB L2SAP STS, in Section
4.9.1.1.
```

### 2.13.6.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | SAP block number (0-63) |
| L2SapSts | Destination of Layer 2 SAP status |
| RxData | Destination of received data |

### 2.13.6.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.13.6.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - L2SapSts and/or RxData |
| 2000 011a | Card access timeout |
| 2000 021f | Memory Page busy |
| 2000 0235 | Receive data not available |
| 2000 0241 | Invalid SAP block number (0-63) |

## 2.13.7 PFB_GetL2SapRxData

### 2.13.7.1 Description

Gets the Layer 2 SAP receive data.

### 2.13.7.2 Prototype

```
BOOL WINAPI PFB_GetL2SapRxData (DWORD CardHandle, BYTE BlkNum, BYTE Ofs, BYTE
Len, BYTE* DataBuf)
```

### 2.13.7.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | SAP block number (0-63) |
| Ofs | Offset of the RX Data |
| Len | Length of the data to be read |
| DataBuf | Destination of SAP RX Data |

### 2.13.7.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.13.7.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - DataBuf |
| 2000 011a | Card access timeout |
| 2000 0235 | Receive data not available |
| 2000 0236 | Invalid relative offset (Ofs >= RxDataLen) |
| 2000 0237 | Invalid relative length (Len > RxDataLen - Ofs) |
| 2000 0241 | Invalid SAP block number (0-63) |

## 2.13.8 PFB_GetL2SapSts

### 2.13.8.1 Description

Gets the SAP status parameters for Layer 2.

### 2.13.8.2 Prototype

```
BOOL WINAPI PFB_GetL2SapSts (DWORD CardHandle, BYTE BlkNum, PFB_L2SAP_STS*
L2SapSts). For details, refer to PFB L2SAP STS, in Section 4.9.1.1.
```

### 2.13.8.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | SAP block number (0-63) |
| L2SapSts | Destination of Layer 2 SAP status |

### 2.13.8.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.13.8.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - L2SapSts |
| 2000 011a | Card access timeout |
| 2000 0241 | Invalid SAP block number (0-63) |

## 2.13.9 PFB_GetL2SapTxData

### 2.13.9.1 Description

Gets the Layer 2 SAP transmit data.

### 2.13.9.2 Prototype

```
BOOL WINAPI PFB_GetL2SapTxData (DWORD CardHandle, BYTE BlkNum, BYTE Ofs, BYTE
Len, BYTE* DataBuf)
```

### 2.13.9.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | SAP block number (0-63) |
| Ofs | Offset of the TX Data |
| Len | Length of the data to be read |
| DataBuf | Destination of SAP TX Data |

### 2.13.9.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.13.9.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - DataBuf |
| 2000 011a | Card access timeout |
| 2000 0238 | Invalid relative offset (Ofs >= TxDataLen) |
| 2000 0239 | Invalid relative length (Len >= TxDataLen - Ofs) |
| 2000 023a | Transmit data not configured (TxDataLen = 0) |
| 2000 0241 | Invalid SAP block number (0-63) |

## 2.13.10 PFB_GetL2SapType

### 2.13.10.1 Description

Gets the Layer 2 SAP type.

### 2.13.10.2 Prototype

```
BOOL WINAPI PFB_GetL2SapType (DWORD CardHandle, BYTE BlkNum, BYTE* L2SapType)
```

### 2.13.10.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | SAP block number (0-63) |
| L2SapType | Destination of Layer 2 SAP type |

### 2.13.10.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.13.10.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - L2SapType |
| 2000 011a | Card access timeout |
| 2000 0241 | Invalid SAP block number (0-63) |

## 2.13.11 PFB_InitL2SapBlk

### 2.13.11.1 Description

Initializes the Layer 2 SAP control block.

### 2.13.11.2 Prototype

```
BOOL WINAPI PFB_InitL2SapBlk (DWORD CardHandle, BYTE BlkNum, BYTE MaxRxLen,
BYTE MaxTxLen)
```

### 2.13.11.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | SAP block number (0-63) |
| MaxRxLen | Maximum length of received data |
| MaxTxLen | Maximum length of transmit data |

### 2.13.11.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.13.11.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0241 | Invalid SAP block number (0-63) |
| 2000 024c | Invalid SAP Receive Length (0-244) |
| 2000 024d | Invalid SAP Transmit Length (0-244) |
| 2000 04xx | Not Offline state - cannot configure<br>(xx contains current command) |

## 2.13.12 PFB_InitL2SapGlb

### 2.13.12.1 Description

Initializes the Layer 2 SAP global control register. This function enables SAP Services on the card and updates the SAP Disable LED bit.

### 2.13.12.2 Prototype

```
BOOL WINAPI PFB_InitL2SapGlb (DWORD CardHandle, BOOL DisLed)
```

### 2.13.12.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| DisLed | TRUE - disable LED, FALSE - enable LED |

### 2.13.12.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.13.12.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 04xx | Not Offline state - cannot configure<br>(xx contains current command) |

## 2.13.13 PFB_PutL2SapCfg

### 2.13.13.1 Description

Writes the Layer 2 SAP configuration parameters.

### 2.13.13.2 Prototype

```
BOOL WINAPI PFB_PutL2SapCfg (DWORD CardHandle, BYTE BlkNum, PFB_L2SAP_CFG*
L2SapCfg). For details, refer to PFB L2SAP CFG, in Section 4.8.1.1.
```

### 2.13.13.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | SAP block number (0-63) |
| L2SapCfg | Source of Layer 2 SAP Control Block Data |

### 2.13.13.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.13.13.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0241 | Invalid SAP block number (0-63) |
| 2000 024e | Invalid SAP Station (0-126) |
| 2000 024f | Invalid SAP Number (0-63) |
| 2000 0250 | Invalid SAP Control Configuration register (refer to definitions related to lay2sCntCfg, in Section 4.8.1.1). |
| 2000 0251 | Invalid SAP Time-out Time * 10ms (1-8190, 0=disable) |
| 2000 0252 | Invalid SAP Frame Control Value (refer to definitions related to lay2sFrmCntrl, in Section 4.8.1.1). |
| 2000 04xx | Not Offline state - cannot configure<br>(xx contains current command) |

## 2.13.14 PFB_PutL2SapCntCfg

### 2.13.14.1 Description

Writes the Layer 2 SAP control configuration register.

### 2.13.14.2 Prototype

```
BOOL PFB_PutL2SapCntCfg (DWORD CardHandle, BYTE BlkNum, BYTE L2SapCntCfg)
```

### 2.13.14.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | SAP block number (0-63) |
| L2SapCntCfg | Source of Layer 2 SAP control configuration register |

### 2.13.14.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.13.14.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0241 | Invalid SAP block number (0-63) |
| 2000 0250 | Invalid SAP Control Configuration register (refer to definitions related to lay2sCntCfg, in Section 4.8.1.1). |

## 2.13.15 PFB_PutL2SapResponse

### 2.13.15.1 Description

Writes the Layer 2 SAP response data.

### 2.13.15.2 Prototype

```
BOOL WINAPI PFB_PutL2SapResponse (DWORD CardHandle, BYTE BlkNum, BYTE TxLen,
BYTE* TxData)
```

### 2.13.15.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | SAP block number (0-63) |
| TxLen | Length of data to transmit |
| L2SapCfg | Source of SAP transmit data |

### 2.13.15.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.13.15.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0241 | Invalid SAP block number (0-63) |
| 2000 0253 | Invalid SAP Response Transmit Length (TX length must be less or equal to configured length) |

## 2.13.16 PFB_PutL2SapTxData

### 2.13.16.1 Description

Writes the Layer 2 SAP transmit data.

### 2.13.16.2 Prototype

```
BOOL WINAPI PFB_PutL2SapTxData (DWORD CardHandle, BYTE BlkNum, BYTE Ofs, BYTE
Len, BYTE* DataBuf)
```

### 2.13.16.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| BlkNum | SAP block number (0-63) |
| Ofs | Offset of the TX Data |
| Len | Length of the data to be written |
| DataBuf | Source of SAP TX Data |

#### 2.13.16.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

#### 2.13.16.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |
| 2000 0238 | Invalid relative offset (Ofs >= TxDataLen) |
| 2000 0239 | Invalid relative length (Len >= TxDataLen - Ofs) |
| 2000 0241 | Invalid SAP block number (0-63) |

## 2.14 DP Master Class II API

### 2.14.1 PFB_AckMC2MasterError

#### 2.14.1.1 Description

Acknowledges a Master Class II to Master Class I error so that the next error can be processed.

#### 2.14.1.2 Prototype

```
BOOL WINAPI PFB_ AckMC2MasterError (DWORD CardHandle)
```

#### 2.14.1.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |

#### 2.14.1.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

#### 2.14.1.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

### 2.14.2 PFB_AckMC2MasterEvent

#### 2.14.2.1 Description

Acknowledges a Master Class II event so that the next event can be processed.

#### 2.14.2.2 Prototype

```
BOOL WINAPI PFB_ AckMC2MasterEvent (DWORD CardHandle)
```

#### 2.14.2.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |

#### 2.14.2.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

#### 2.14.2.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

## 2.14.3 PFB_AckMC2SlaveError

### 2.14.3.1 Description

Acknowledges a Master Class II event to a slave error so that the next error can be processed.

### 2.14.3.2 Prototype

```
BOOL WINAPI PFB_ AckMC2SlaveError (DWORD CardHandle)
```

### 2.14.3.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |

### 2.14.3.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.14.3.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

## 2.14.4 PFB_AckMC2SlaveEvent

### 2.14.4.1 Description

Acknowledges a Master Class II slave event so that the next event can be processed.

### 2.14.4.2 Prototype

```
BOOL WINAPI PFB_ AckMC2SlaveEvent (DWORD CardHandle)
```

### 2.14.4.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |

### 2.14.4.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.14.4.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

## 2.14.5 PFB_GetMC2MasterBlock

### 2.14.5.1 Description

Reads the PFB_MC2_MASTER_BLK structure from the card host interface memory.

### 2.14.5.2 Prototype

```
BOOL PFB_ GetMC2MasterBlock (DWORD CardHandle, PFB_MC2_MASTER_BLK
*Mc2MasterBlk). For details, refer to PFB MC2 MASTER BLK, in
Section 4.16.1.1.
```

### 2.14.5.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Mc2MasterBlk | Pointer to the structure that will receive the current block information |

### 2.14.5.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.14.5.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

## 2.14.6 PFB_GetMC2MasterCfg

### 2.14.6.1 Description

Reads the PFB_MC2_MASTER_CFG structure from the card host interface memory.

### 2.14.6.2 Prototype

```
BOOL PFB_GetMC2MasterCfg (DWORD CardHandle, PFB_MC2_MASTER_CFG *Mc2MasterCfg),
BYTE *GlbDPMsgBlk). For details, refer to PFB_MC2_MASTER_CFG, in Section
4.14.1.1.
```

### 2.14.6.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Mc2MasterCfg | Pointer to the structure that will receive the current configuration |

### 2.14.6.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.14.6.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

## 2.14.7 PFB_GetMC2MasterRxData

### 2.14.7.1 Description

Reads the result of a Master Class II to Master Class I transaction.

### 2.14.7.2 Prototype

```
BOOL WINAPI PFB_ GetMC2MasterRxData (DWORD CardHandle, PFB_MC2_MASTER_RD
*Mc2MasterRd, BYTE *RxData). For details, refer to PFB_MC2_MASTER_RD,
in Section 4.15.1.1.
```

### 2.14.7.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Mc2MasterRd | Pointer to the structure that will hold the status information from the last Master Class II transaction |
| RxData | Pointer to the buffer that will hold the returned data, if any, from the last Master Class II transaction |

### 2.14.7.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.14.7.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

## 2.14.8 PFB_GetMC2SlaveCfg

### 2.14.8.1 Description

Reads the PFB_MC2_SLV_CFG structure from the card host interface memory.

### 2.14.8.2 Prototype

```
BOOL PFB_GetMC2SlaveCfg (DWORD CardHandle, PFB_MC2_SLV_CFG *Mc2SlaveCfg, BYTE
*GlbDPMsgBlk). For details, refer to PFB MC2 SLV CFG, in Section 4.12.1.1.
```

### 2.14.8.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Mc2SlaveCfg | Pointer to the structure that will receive the current configuration |

### 2.14.8.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.14.8.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 010e | Invalid offset |
| 2000 011a | Card access timeout |

## 2.14.9 PFB_GetMC2SlaveRd

### 2.14.9.1 Description

Reads the PFB_MC2_SLV_RD structure for status information and the data received from the card host interface memory.

### 2.14.9.2 Prototype

```
BOOL PFB_GetMC2SlaveRd (DWORD CardHandle, BYTE DstStn, BYTE RdArea,
PFB_MC2_SLV_RD *Mc2SlaveRd,    BYTE *RxData). For details, refer to
PFB_MC2_SLV_RD, in Section 4.13.1.1.
```

### 2.14.9.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| DstStn | The slave station address |
| RdArea | The area to read from the slave. For example, input table, output table and configuration. |
| Mc2SlaveRd | Pointer to the structure that will receive the current status of the last read |
| RxData | Pointer to the buffer that will receive any returned data |

### 2.14.9.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.14.9.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

## 2.14.10 PFB_PutMC2MasterCfg

### 2.14.10.1 Description

Writes the PFB_MC2_MASTER_CFG structure to the card host interface memory.

### 2.14.10.2 Prototype

```
BOOL PFB_ PutMC2MasterCfg (DWORD CardHandle, PFB_MC2_MASTER_CFG *Mc2MasterCfg).
For details, refer to PFB MC2 MASTER CFG, in Section 4.14.1.1.
```

### 2.14.10.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Mc2MasterCfg | Pointer to the structure that contains configuration information. |

### 2.14.10.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.14.10.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

## 2.14.11 PFB_PutMC2MasterTxData

### 2.14.11.1 Description

Writes the information for a Master Class II to Master Class I transaction.

### 2.14.11.2 Prototype

```
BOOL WINAPI PFB_ PutMC2MasterTxData (DWORD CardHandle, BYTE DstStn,
PFB_MC2_MASTER_WRT *Mc2MasterWrt, BYTE *TxData). For details, refer to
PFB_MC2_MASTER_WRT, in Section 4.16.2.1.
```

### 2.14.11.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| DstStn | The station address of the target Master |
| Mc2MasterWrt | Pointer to the structure that holds the information for the current Master Class II transaction |
| TxData | Pointer to the buffer that holds the command data, if any, for the current Master Class II transaction |

### 2.14.11.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.14.11.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

## 2.14.12 PFB_PutMC2SlaveCfg

### 2.14.12.1 Description

Writes the PFB_MC2_SLV_CFG structure to the card host interface memory.

### 2.14.12.2 Prototype

```
BOOL PFB_PutMC2SlaveCfg (DWORD CardHandle, PFB_MC2_SLV_CFG *Mc2SlaveCfg).
For details, refer to PFB_MC2_SLV_CFG, in Section 4.12.1.1.
```

### 2.14.12.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Mc2SlaveCfg | Pointer to the structure that contains configuration information. |

### 2.14.12.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.14.12.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 010e | Invalid offset |
| 2000 011a | Card access timeout |

## 2.14.13 PFB_SetMC2SlaveAddr

### 2.14.13.1 Description

Writes the PFB_MC2_SETSLV_ADDR structure to the card host interface memory. This will send an SSA message to a slave and if the slave supports this service, it will change the slave's station address.

### 2.14.13.2 Prototype

```
BOOL PFB_SetMC2SlaveAddr  (DWORD CardHandle, BYTE DstStn, BYTE RdArea,
PFB_MC2_SETSLV_ADDR *Mc2SetSlaveAddr, BYTE *TxData). For details, refer
to PFB_MC2_SETSLV_ADDR, in Section 4.13.2.1.
```

### 2.14.13.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| DstStn | The current slave station address |
| RdArea | The area to write to the slave. This should always be the Set_Slave_Addr Sap (55). |
| Mc2SetSlaveAddr | Pointer to the structure that receives the result of the set slave address message. |
| TxData | Pointer to the buffer that contains the set slave address message (see DIN 19 245, part 3). |

### 2.14.13.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 2.14.13.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied (sharing violation). Card must be opened with the SS_WRITE flag. |
| 2000 011a | Card access timeout |

# 3
# PFBMAN32 DLL DPV1 API

## Chapter Sections:

- This chapter defines the API *(Application Programming Interface)* for the PFBMAN32 DLL's DPV1

# 3.1 Introduction

This chapter defines the API *(Application Programming Interface)* for the PFBMAN32 DLL's DPV1.

## 3.1.1 DPV1 API Features

The DPV1 API's features include:

- Master Class1 & Class2
- Mono-thread DLL

# 3.2 Configuration

The SST Profibus Configuration Tool for Windows (PbCfg.exe) can enable DPV1 Master Class 1 services for supporting slaves through a "DPV1_Enable" key in the GSD file.

# 3.3 API

The API provides:

- Functions for DLL initialization
- Functions for DPV1 services

## 3.3.1 Initialization

Before DPV1 functions can be used, DPV1_Init must be called, in CONFIGURED/OFFLINE mode. This function allocates resources for FDL blocks. DPV1_Exit releases theses resources.

### 3.3.2 DPV1 Services

For all DPV1 services, the API provides 2 asynchronous functions (except MSAC2_Abort):

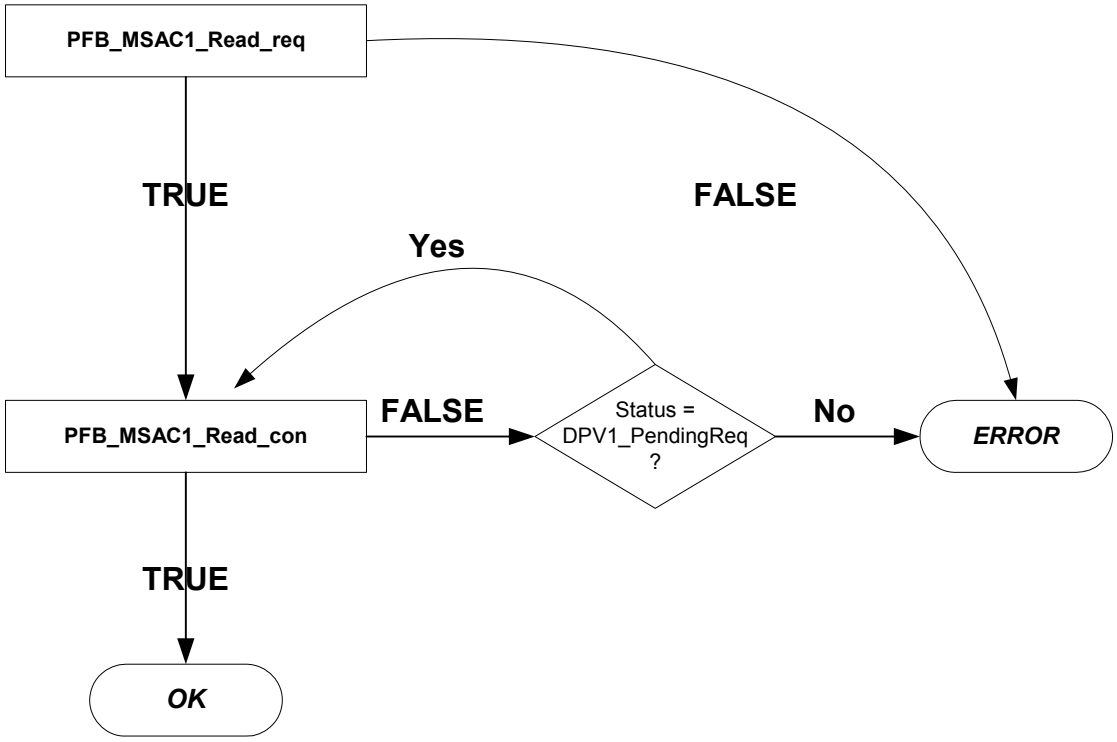
- 1 function to send the request
- 1 function to request the confirmation

| | DPV1 Services | API |
|---|---|---|
| DPV1 Class 1 | MSAC1_Read | MSAC1_Read_req<br>MSAC1_Read_con |
| | MSAC1_Write | MSAC1_Write_req<br>MSAC1_Write_con |
| DPV1 Class 2 | MSAC2_Initiate | MSAC2_Initiate_req<br>MSAC2_Initiate_con |
| | MSAC2_Read | MSAC2_Read_req<br>MSAC2_Read_con |
| | MSAC2_Write | MSAC2_Write_req<br>MSAC2_Write_con |
| | MSAC2_Idle | MSAC2_Idle_req<br>MSAC2_Idle_con |
| | MSAC2_Abort | MSAC2_Abort_req |

### 3.3.2.1 Example of Read Class 1 Function

The application uses *PFB_MSAC1_Read_req()* to send the request to the device, and *PFB_MSAC1_Read_con()* to receive the confirmation while the status is DPV1_PendingReq.

Figure 1: Example of Read Class 1 Function

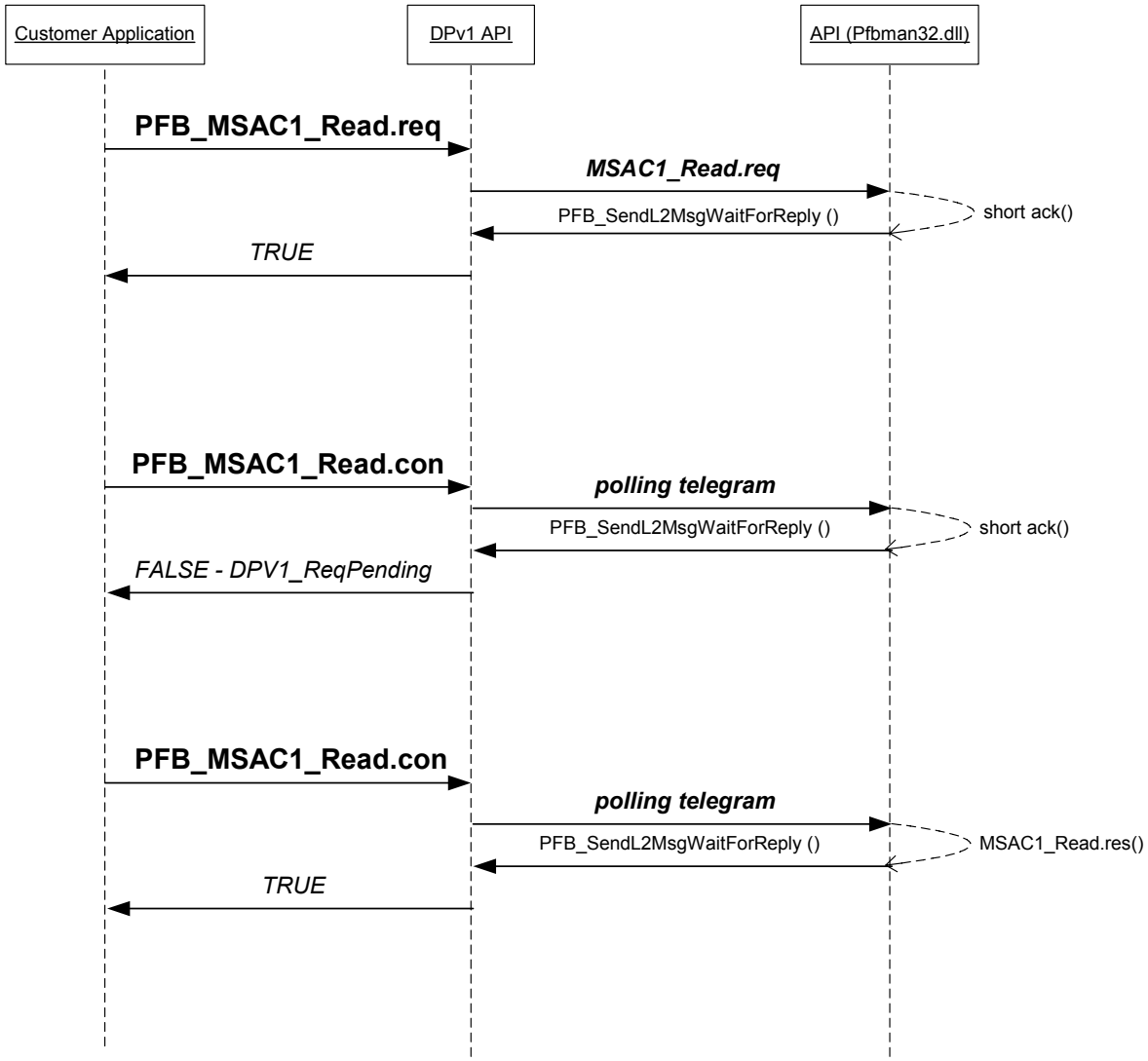



### How it Works

All functions use *PFB_SendL2MsgWaitForReply()*

- The request function (_req) sends the DPV1 frame to the device
- The confirmation function (_con) sends a polling telegram to the device

Figure 2: Example of DPV1 Master Class 1 Read Services Typical Sequence




## How to Use DPV1 Class 2:

- Initiate a connection with PFB_MSAC2_Initiate_req and PFB_MSAC2_Initiate_con
- Use DPV1 class 2 functions. If you don't use theses functions during Send_TimeOut time, the slave will close the connection. The MSAC2_Idle could be used to keep this connection alive.
- Close the connection with PFB_MSAC2_Abort_req function

## 3.3.3 DPV1_Init

### 3.3.3.1 Description

Allocates resources needed by DPV1 functions. Use DPV1_Exit to free resources.

### 3.3.3.2 Prototype

```
BOOL PFB_DPV1_Init ( DWORD              CardHandle,
                     BYTE               Nb_Blocks,
                     BYTE *             Nb_Blocks_Allocated    );
```

### 3.3.3.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Nb_Blocks | Number of FDL blocks to allocate (1 to 128) |
| Nb_Blocks_Allocated | Number of FDL blocks allocated (0 to 128) |

### 3.3.3.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 3.3.3.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied |
| 2000 0114 | Invalid Pointer – Nb_Blocks_Allocated |
| 2000 011A | Card access timeout |
| 2000 04XX | Not Offline state - cannot allocate resources |
| 2000 0604 | Invalid number of blocks requested |
| 2000 060A | No FDL block available |
| 2000 060B | DPV1 already initialized |

## 3.3.4 DPV1_Exit

### 3.3.4.1 Description

Releases resources allocated by the DPV1_Init function.

### 3.3.4.2 Prototype

```
BOOL PFB_DPV1_Exit ( DWORD CardHandle );
```

### 3.3.4.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |

### 3.3.4.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 3.3.4.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0102 | Invalid CardHandle |
| 2000 0103 | Write access denied |
| 2000 011A | Card access timeout |
| 2000 060C | DPV1 already released or not initialized |

## 3.3.5 MSAC1_Read (PFB_MSAC1_Read_req)

### 3.3.5.1 Description

Sends the Read Data request to the slave. The data to be read is addressed via the Slot and Index.

### 3.3.5.2 Prototype

```
BOOL PFB_MSAC1_Read_req ( DWORD         CardHandle,
                          BYTE               Rem_Add,
                          BYTE               Slot_Number,
                          BYTE               Index,
                          BYTE               Length,
                          DWORD         Timeout,
                          PFB_DPV1_STS *DPV1Sts   );
```

For details, refer to PFB_DPV1_STS, in Section 3.3.19.1.

### 3.3.5.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Rem_Add | Slave Address (0 to 126) |
| Slot_Number | Slot number of the data to be read (0 to 254) |
| Index | Index of the data to be read (0 to 254) |
| Length | Number of bytes to be read (1 to 240) |
| Timeout | Time allowed for message reply, in milliseconds |
| DPV1Sts | DPV1 status (refer to Section 3.3.19, Structure Definition (PFB_DPV1_STS). |

### 3.3.5.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

#### 3.3.5.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer – DPV1Sts |
| 2000 011A | Card access timeout |
| 2000 0257 | Message reply timeout |
| 2000 025C | Online state expected |
| 2000 0502 | FDL error - see PFB_DPV1_STS structure definition |
| 2000 0601 | Invalid slave address |
| 2000 0602 | Invalid length |
| 2000 0603 | No more FDL blocks available |
| 2000 060C | DPV1 not initialized |

## 3.3.6 MSAC1_Read (PFB_MSAC1_Read_con)

### 3.3.6.1 Description

Sends the polling telegram to the slave to receive the Read Data response.

### 3.3.6.2 Prototype

```
BOOL PFB_MSAC1_Read_con ( DWORD          CardHandle,
                          BYTE               Rem_Add,
                          BYTE *         Length,
                          BYTE *         Data,
                          DWORD          Timeout,
                          PFB_DPV1_STS *     DPV1Sts   );
```

For details, refer to PFB_DPV1_STS, in Section 3.3.19.1.

### 3.3.6.3 Arguments

| Name | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Rem_Add | Slave Address (0 to 126) |
| Length | Number of bytes read (0 to 240) |
| Data | Data Buffer |
| Timeout | Time allowed for message reply, in milliseconds |
| DPV1Sts | DPV1 status (refer to Section 3.3.19, Structure Definition (PFB_DPV1_STS). |

### 3.3.6.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 3.3.6.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - Length, Data and/or DPV1Sts |
| 2000 011A | Card access timeout |
| 2000 0257 | Message reply timeout |
| 2000 025C | Online state expected |
| 2000 0501 | DPV1 error - see PFB_DPV1_STS structure definition |
| 2000 0502 | FDL error - see PFB_DPV1_STS structure definition |
| 2000 0601 | Invalid slave address |
| 2000 0603 | No more FDL blocks available |
| 2000 0608 | Slave is not ready to deliver the response to a request |
| 2000 0609 | Invalid slave response |
| 2000 060C | DPV1 not initialized |

## 3.3.7 MSAC1_Write (PFB_MSAC1_Write_req)

### 3.3.7.1 Description

Sends the Write Data request to the slave. The data to be written is addressed via the Slot and Index.

### 3.3.7.2 Prototype

```
BOOL PFB_MSAC1_Write_req (     DWORD          CardHandle,
                               BYTE           Rem_Add,
                               BYTE           Slot_Number,
                               BYTE           Index,
                               BYTE           Length,
                               BYTE *         Data,
                               DWORD          Timeout,
                               PFB_DPV1_STS *     DPV1Sts   );
```

For details, refer to PFB_DPV1_STS, in Section 3.3.19.1.

### 3.3.7.3 Arguments

| Name | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Rem_Add | Slave Address (0 to 126) |
| Slot_Number | Slot number of the Data to be written (0 to 254 ) |
| Index | Index of the Data to be written (0 to 254 ) |
| Length | Number of bytes to be written (1 to 240) |
| Data | Data Buffer |
| Timeout | Time allowed for message reply, in milliseconds |
| DPV1Sts | DPV1 status (refer to Section 3.3.19, Structure Definition (PFB_DPV1_STS). |

### 3.3.7.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

#### 3.3.7.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - Data and/or DPV1Sts |
| 2000 011A | Card access timeout |
| 2000 0257 | Message reply timeout |
| 2000 025C | Online state expected |
| 2000 0502 | FDL error - see PFB_DPV1_STS structure definition |
| 2000 0601 | Invalid slave address |
| 2000 0602 | Invalid length |
| 2000 0603 | No more FDL blocks available |
| 2000 060C | DPV1 not initialized |

## 3.3.8 MSAC1_Write (PFB_MSAC1_Write_con)

### 3.3.8.1 Description

Sends the polling telegram to the slave to receive the Write Data response.

### 3.3.8.2 Prototype

```
BOOL PFB_MSAC1_Write_con (     DWORD          CardHandle,
                               BYTE           Rem_Add,
                               BYTE *         Length,
                               DWORD          Timeout,
                               PFB_DPV1_STS *     DPV1Sts   );
```

For details, refer to PFB_DPV1_STS, in Section 3.3.19.1.

### 3.3.8.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| Rem_Add | Slave Address (0 to 126) |
| Length | Number of bytes written (0 to 240) |
| Timeout | Time allowed for message reply, in milliseconds |
| DPV1Sts | DPV1 status (refer to Section 3.3.19, Structure Definition (PFB_DPV1_STS). |

### 3.3.8.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 3.3.8.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - Length and/or DPV1Sts |
| 2000 011A | Card access timeout |
| 2000 0257 | Message reply timeout |
| 2000 025C | Online state expected |
| 2000 0501 | DPV1 error - see PFB_DPV1_STS structure definition |
| 2000 0502 | FDL error - see PFB_DPV1_STS structure definition |
| 2000 0608 | Slave is not ready to deliver the response to a request |
| 2000 0601 | Invalid slave address |
| 2000 0603 | No more FDL blocks available |
| 2000 0609 | Invalid slave response |
| 2000 060C | DPV1 not initialized |

## 3.3.9 MSAC2_Initiate (PFB_MSAC2_Initiate_req)

### 3.3.9.1 Description

Sends the Initiate request to the slave. The C_Ref parameter is the reference of the connection and must be used with class 2 functions.

### 3.3.9.2 Prototype

```
BOOL PFB_MSAC2_Initiate_req (DWORD           CardHandle,
                             DWORD *         C_Ref,
                             BYTE                 Rem_Add,
                             WORD            Send_TimeOut,
                             WORD            Features_Supported,
                             WORD            Profile_Features_Supported,
                             WORD            Profile_Ident_Number,
                             PFB_DPV1_ADDR_PARAM  Add_Addr_Param,
                             DWORD           Timeout,
                             PFB_DPV1_STS *       DPV1Sts  );
```

For details, refer to PFB_DPV1_ADDR_PARAM, in Section 3.3.18.1, and PFB_DPV1_STS, in Section 3.3.19.1.

### 3.3.9.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| C_Ref | Connection reference returned |
| Rem_Add | Slave Address (0 to 126) |
| Send_Timeout | Time expected in 10 ms |
| Features_Supported | Features supported by the master |
| Profile_Features_Supported | Service functionality supported by the master |
| Profile_Ident_Number | Desired profile ID number (0 = no profile) |
| Add_Addr_Param | Subnet parameters - see structure definition |
| Timeout | Time allowed for message reply, in milliseconds |
| DPV1Sts | DPV1 status (refer to Section 3.3.19, Structure Definition (PFB_DPV1_STS). |

### 3.3.9.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 3.3.9.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - C_Ref and/or DPV1Sts |
| 2000 011A | Card access timeout |
| 2000 0257 | Message reply timeout |
| 2000 025C | Online state expected |
| 2000 0501 | DPV1 error - see PFB_DPV1_STS structure definition |
| 2000 0502 | FDL error - see PFB_DPV1_STS structure definition |
| 2000 0601 | Invalid slave address |
| 2000 0603 | No more FDL blocks available |
| 2000 0607 | Invalid Add_Addr_Param parameters |
| 2000 0609 | Invalid slave response |
| 2000 060C | DPV1 not initialized |

## 3.3.10 MSAC2_Initiate (PFB_MSAC2_Initiate_con)

### 3.3.10.1 Description

Sends the polling telegram to the slave to receive the Initiate response. The connection must be polled to remain alive. The time is defined by Send_TimeOut parameter. More information on Class 2 Initialization can be obtained from "Profibus – DP Extensions to EN 50170 (DPV1)" by PNO.

### 3.3.10.2 Prototype

```
BOOL PFB_MSAC2_Initiate_con    (DWORD    CardHandle,
                                DWORD     C_Ref,
                                WORD *    Send_TimeOut,
                                WORD *    Features_Supported,
                                WORD *    Profile_Features_Supported,
                                WORD *    Profile_Ident_Number,
                                DWORD     Timeout
                                PFB_DPV1_STS *     DPV1Sts   );
```

For details, refer to PFB_DPV1_STS, in Section 3.3.19.1.

### 3.3.10.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| C_Ref | Connection reference |
| Send_Timeout | Updated Time by the slave in 10 ms |
| Features_Supported | Features supported by the slave |
| Profile_Features_Supported | Service functionality supported by the slave |
| Profile_Ident_Number | Profile ID supported by the slave |
| Timeout | Time allowed for message reply, in milliseconds |
| DPV1Sts | DPV1 status (refer to Section 3.3.19, Structure Definition (PFB_DPV1_STS). |

### 3.3.10.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 3.3.10.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - Send_TimeOut, Features_Supported, Profile_Features_Supported, Profile_Ident_Number and/or DPV1Sts |
| 2000 011A | Card access timeout |
| 2000 0257 | Message reply timeout |
| 2000 025C | Online state expected |
| 2000 0501 | DPV1 error - see PFB_DPV1_STS structure definition |
| 2000 0502 | FDL error - see PFB_DPV1_STS structure definition |
| 2000 0603 | No more FDL blocks available |
| 2000 0606 | Class 2 connection not initialized |
| 2000 0608 | Slave is not ready to deliver the response to a request |
| 2000 0609 | Invalid slave response |
| 2000 060C | DPV1 not initialized |
| 2000 060D | Invalid C_Ref |

## 3.3.11 MSAC2_Abort (PFB_MSAC2_Abort_req)

### 3.3.11.1 Description

Sends the Abort request to the slave. This aborts the initiated connection. There is no confirmation function.

### 3.3.11.2 Prototype

```
BOOL PFB_MSAC2_Abort_req (     DWORD     CardHandle,
                               DWORD     C_Ref,
                               BYTE           Subnet,
                               WORD      Instance_ReasonCode,
                               DWORD     Timeout,
                               PFB_DPV1_STS *     DPV1Sts   );
```

For details, refer to PFB_DPV1_STS, in Section 3.3.19.1.

### 3.3.11.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| C_Ref | Connection reference |
| Subnet | Location of the abort request source |
| Instance/Reason_Code | Protocol instance and reason for the abort |
| Timeout | Time allowed for message reply, in milliseconds |
| DPV1Sts | DPV1 status (refer to Section 3.3.19, Structure Definition (PFB_DPV1_STS). |

### 3.3.11.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

#### 3.3.11.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - DPV1Sts |
| 2000 011A | Card access timeout |
| 2000 0257 | Message reply timeout |
| 2000 025C | Online state expected |
| 2000 0502 | FDL error - see PFB_DPV1_STS structure definition |
| 2000 0603 | No more FDL blocks available |
| 2000 0606 | Class 2 connection not initialized |
| 2000 060C | DPV1 not initialized |
| 2000 060D | Invalid C_Ref |

## 3.3.12 MSAC2Read (PFB_MSAC2_Read_req)

### 3.3.12.1 Description

Sends the Read Data request to the slave. The data to be read is addressed via the Slot and Index.

### 3.3.12.2 Prototype

```
BOOL PFB_MSAC2_Read_req ( DWORD     CardHandle,
                          DWORD          C_Ref,
                          BYTE      Slot_Number,
                          BYTE           Index,
                          BYTE           Length,
                          DWORD     Timeout,
                          PFB_DPV1_STS *     DPV1Sts   );
```

For details, refer to PFB_DPV1_STS, in Section 3.3.19.1.

### 3.3.12.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| C_Ref | Connection reference |
| Slot_Number | Slot number of the Data to be read (0 to 254 ) |
| Index | Index of the Data to be read (0 to 254 ) |
| Length | Number of bytes to be read (1 to 240) |
| Timeout | Time allowed for message reply, in milliseconds |
| DPV1Sts | DPV1 status (refer to Section 3.3.19, Structure Definition (PFB_DPV1_STS). |

### 3.3.12.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 3.3.12.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - DPV1Sts |
| 2000 011A | Card access timeout |
| 2000 0257 | Message reply timeout |
| 2000 025C | Online state expected |
| 2000 0502 | FDL error - see PFB_DPV1_STS structure definition |
| 2000 0602 | Invalid length |
| 2000 0603 | No more FDL blocks available |
| 2000 0606 | Class 2 connection not initialized |
| 2000 060C | DPV1 not initialized |
| 2000 060D | Invalid C_Ref |

## 3.3.13 MSAC2Read (PFB_MSAC2_Read_con)

### 3.3.13.1 Description

Sends the polling telegram to the slave to receive the Read Data response.

### 3.3.13.2 Prototype

```
BOOL PFB_MSAC2_Read_con ( DWORD     CardHandle,
                          DWORD          C_Ref,
                          BYTE *    Length,
                          BYTE *    Data,
                          DWORD     Timeout,
                          PFB_DPV1_STS *     DPV1Sts   );
```

For details, refer to PFB_DPV1_STS, in Section 3.3.19.1.

### 3.3.13.3 Arguments

| Argument | Type |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| C_Ref | Connection reference |
| Length | Number of bytes read (0 to 240) |
| Data | Data Buffer |
| Timeout | Time allowed for message reply in milliseconds |
| DPV1Sts | DPV1 status (refer to Section 3.3.19, Structure Definition (PFB_DPV1_STS). |

### 3.3.13.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 3.3.13.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - Length, Data and/or DPV1Sts |
| 2000 011A | Card access timeout |
| 2000 0257 | Message reply timeout |
| 2000 025C | Online state expected |
| 2000 0501 | DPV1 error - see PFB_DPV1_STS structure definition |
| 2000 0502 | FDL error - see PFB_DPV1_STS structure definition |
| 2000 0603 | No more FDL blocks available |
| 2000 0608 | Slave is not ready to deliver the response to a request |
| 2000 0606 | Class 2 connection not initialized |
| 2000 0609 | Invalid slave response |
| 2000 060C | DPV1 not initialized |
| 2000 060D | Invalid C_Ref |

## 3.3.14 MSAC2_Write (PFB_MSAC2_Write_req)

### 3.3.14.1 Description

Sends the Write Data request to the slave. The data to be written is addressed via the Slot and Index.

### 3.3.14.2 Prototype

```
BOOL PFB_MSAC2_Write_req (     DWORD     CardHandle,
                           DWORD         C_Ref,
                           BYTE          Slot_Number,
                           BYTE          Index,
                           BYTE          Length,
                           BYTE *    Data,
                           DWORD     Timeout,
                           PFB_DPV1_STS *     DPV1Sts   );
```

For details, refer to PFB_DPV1_STS, in Section 3.3.19.1.

### 3.3.14.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| C_Ref | Connection reference |
| Slot_Number | Slot number of the Data to be written (0 to 254 ) |
| Index | Index of the Data to be written (0 to 254 ) |
| Length | Number of bytes to be written (1 to 240) |
| Data | Data Buffer |
| Timeout | Time allowed for message reply, in milliseconds |
| DPV1Sts | DPV1 status (refer to Section 3.3.19, Structure Definition (PFB_DPV1_STS). |

### 3.3.14.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 3.3.14.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - Data and/or DPV1Sts |
| 2000 011A | Card access timeout |
| 2000 0257 | Message reply timeout |
| 2000 025C | Online state expected |
| 2000 0502 | FDL error - see PFB_DPV1_STS structure definition |
| 2000 0602 | Invalid length |
| 2000 0603 | No more FDL blocks available |
| 2000 0606 | Class 2 connection not initialized |
| 2000 060C | DPV1 not initialized |
| 2000 060D | Invalid C_Ref |

## 3.3.15 MSAC2_Write (PFB_MSAC2_Write_con)

### 3.3.15.1 Description

Sends the polling telegram to the slave to receive the Write Data response.

### 3.3.15.2 Prototype

```
BOOL PFB_MSAC2_Write_con (     DWORD     CardHandle,
                           DWORD         C_Ref,
                           BYTE *    Length,
                           DWORD     Timeout,
                           PFB_DPV1_STS *     DPV1Sts   );
```

For details, refer to PFB_DPV1_STS, in Section 3.3.19.1.

### 3.3.15.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| C_Ref | Connection reference |
| Length | Number of bytes written (0 to 240) |
| Timeout | Time allowed for message reply, in milliseconds |
| DPV1Sts | DPV1 status (refer to Section 3.3.19, Structure Definition (PFB_DPV1_STS). |

### 3.3.15.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 3.3.15.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - Length and/or DPV1Sts |
| 2000 011A | Card access timeout |
| 2000 0257 | Message reply timeout |
| 2000 025C | Online state expected |
| 2000 0501 | DPV1 error - see PFB_DPV1_STS structure definition |
| 2000 0502 | FDL error - see PFB_DPV1_STS structure definition |
| 2000 0603 | No more FDL blocks available |
| 2000 0606 | Class 2 connection not initialized |
| 2000 0608 | Slave is not ready to deliver the response to a request |
| 2000 0609 | Invalid slave response |
| 2000 060C | DPV1 not initialized |
| 2000 060D | Invalid C_Ref |

## 3.3.16 MSAC2_Idle (PFB_MSAC2_Idle_req)

### 3.3.16.1 Description

Sends the Idle request to the slave. This function keeps the connection with the slave open.

### 3.3.16.2 Prototype

```
BOOL PFB_MSAC2_Idle_req ( DWORD     CardHandle,
                          DWORD          C_Ref,
                          DWORD     Timeout,
                          PFB_DPV1_STS *     DPV1Sts   );
```

For details, refer to PFB_DPV1_STS, in Section 3.3.19.1.

### 3.3.16.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| C_Ref | Connection reference |
| Timeout | Time allowed for message reply, in milliseconds |
| DPV1Sts | DPV1 status (refer to Section 3.3.19, Structure Definition (PFB_DPV1_STS). |

### 3.3.16.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 3.3.16.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - DPV1Sts |
| 2000 011A | Card access timeout |
| 2000 0257 | Message reply timeout |
| 2000 025C | Online state expected |
| 2000 0502 | FDL error - see PFB_DPV1_STS structure definition |
| 2000 0603 | No more FDL blocks available |
| 2000 0606 | Class 2 connection not initialized |
| 2000 060C | DPV1 not initialized |
| 2000 060D | Invalid C_Ref |

## 3.3.17 MSAC2_Idle (PFB_MSAC2_Idle_con)

### 3.3.17.1 Description

Sends the polling telegram to the slave to receive the Idle response.

### 3.3.17.2 Prototype

```
BOOL PFB_MSAC2_Idle_con ( DWORD     CardHandle,
                          DWORD          C_Ref,
                          DWORD     Timeout,
                          PFB_DPV1_STS *     DPV1Sts   );
```

For details, refer to PFB_DPV1_STS, in Section 3.3.19.1.

### 3.3.17.3 Arguments

| Argument | Description |
|---|---|
| CardHandle | The handle returned by PFB_OpenCard |
| C_Ref | Connection reference |
| Timeout | Time allowed for message reply in milliseconds |
| DPV1Sts | DPV1 status – see structure definition |

### 3.3.17.4 Returns

| Value | Description |
|---|---|
| TRUE | Success |
| FALSE | Error. Use GetLastError to retrieve the error code. |

### 3.3.17.5 Error Codes

| Value (hex) | Description |
|---|---|
| 2000 0003 | Driver not loaded |
| 2000 0100 | General failure |
| 2000 0102 | Invalid CardHandle |
| 2000 0114 | Invalid pointer - DPV1Sts |
| 2000 011A | Card access timeout |
| 2000 0257 | Message reply timeout |
| 2000 025C | Online state expected |
| 2000 0501 | DPV1 error - see PFB_DPV1_STS structure definition |
| 2000 0502 | FDL error – PFB_DPV1_STS see structure definition |
| 2000 0603 | No more FDL blocks available |
| 2000 0606 | Class 2 connection not initialized |
| 2000 0608 | Slave is not ready to deliver the response to a request |
| 2000 0609 | Invalid slave response |
| 2000 060C | DPV1 not initialized |
| 2000 060D | Invalid C_Ref |

## 3.3.18 Structure Definition (PFB_DPV1_ADDR_PARAM)

### 3.3.18.1 Declaration

```
/* DPV1 C2 sub lan addressing structure definition*/

typedef struct
{
      BYTE                  STYPE;    /* 0 or 1     */
      BYTE                  S_Addr_len;
      BYTE                  DTYPE;    /* 0 or 1     */
      BYTE                  D_Addr_len;
      PFB_DPV1_SUBADDRESS       S_Addr;
      PFB_DPV1_SUBADDRESS       D_Addr;
} PFB_DPV1_ADDR_PARAM;


typedef struct
{
      BYTE   API;                   /* 0 to 255 */
      BYTE   SCL;                   /* 0 to 255 */
      BYTE   Network_Address[6];
      BYTE   *Mac_Address;
} PFB_DPV1_SUBADDRESS;
```

- If STYPE = 1, the optional Network_Address and Mac_Address are present in S_Addr
- S_Addr_Len indicates the length of the S_Addr:
    - If STYPE = 0, the S_Addr_Len should be 2
    - If STYPE = 1, the S_Addr_Len should be 8 + the length of Mac_Address
    - If DTYPE = 1, the optional Network_Address and Mac_Address are present in D_Addr
- D_Addr_Len indicates the length of the D_Addr:
    - If DTYPE = 0, the D_Addr_Len should be 2
    - If DTYPE = 1, the D_Addr_Len should be 8 + the length of Mac_Address
- API identifies the applicom process instance

- SCL identifies the access level
- Network_Address identifies the network address, according to ISO/OSI-Network addresses
- MAC_Address identifies the MAC_Address

## 3.3.19 Structure Definition (PFB_DPV1_STS)

### 3.3.19.1 Declaration

```
typedef struct
{
      DWORD   Error_Code;        /* Error Code of the function */
      BYTE    ExtError[4];       /* Depending of the Error_Code   */
      PFB_DPV1_STS
}
```

If Error_Code = 0x20000501 (DPV1 Error)

```
      ExtError[0]=Error_Decode; /* 128=DPV1, 254=FMS, 255=HART   */
      ExtError[1]=Error_Code1;  /* DPV1 Error Class & Error Code */
      ExtError[2]=Error_Code2;  /* DPV1 user-specific */
```

If Error_Code = 0x20000502 (FDL Error)

```
      ExtError[0]=FDL_ErrorCode;     /* see Lay2sRspStatus */
```

## 3.3.20 Meaning of FDL_ErrorCode

The following table describes the meaning of the FDL_ErrorCode.

| Value | Meaning |
|---|---|
| 0h | OK |
| 1h | User error, SAP locked |
| 2h | No ressource for send data, tried to send to SAP that was not configured |
| 3h | No service available (SAP does not exist) |
| 4h | Access point blocked |
| 80h | Short character, problems with wiring, termination, etc |
| 9Fh | No access |
| AFh | Double token detected, problems with wiring, termination, etc. |
| BFh | Response buffer too small. |
| 8Fh | Noise at SM command, problems with wiring, termination, etc. |

## 3.3.21 Meaning of DPV1 Error

If a DV1 error occurs, the extended error structure contains 3 bytes:

- The first indicates the type of error (its value is always 0x80: DPV1 error)
- The second consists of two parts:
    - The highest four bits represent the error class
    - The lower four bits represent the error code
- The third one contains a slave specific error code

The following table describes the signification for the error class and error code of the second error byte.

| Error_Class | Meaning | Error_Code |
|---|---|---|
| 0 to 9 | Reserved | - |
| 10= | Application | 0 = read error<br>1 = write error<br>2 = module failure<br>3 to 7 : reserved<br>8 : version conflict<br>9 : features not supported<br>10 to 15 : User specific |
| 11= | Access | 0 = invalid index<br>1 = write length error<br>2 = invalid slot<br>3 = type conflict<br>4 = invalid area<br>5 = state conflict<br>6 = access denied<br>7 = invalid range<br>8 = invalid parameter<br>9 = invalid type<br>10…15 : user specific |
| 12 = | Resource | 0 = read constrain conflict<br>1 = write constrain conflict<br>2 = resource busy<br>3 = resource unavailable<br>4 to 7 : reserved<br>8 to 15: use specific |
| 13 to 15 | User specific | - |

# 4

# PFBMAN32 API Structure Definitions

## Chapter Sections:

- This chapter contains an alphabetical list of the DLL data types

# 4.1 Profibus Network

## 4.1.1 Card Status Structure

### 4.1.1.1 Declaration

```
typedef struct
{
/* 5136-PFB Basic Control/Status registers */
      BYTE   pfbCommand;            /* Card command register - see below */
      BYTE   pfbStatus;             /* Card status register - see below */

/* 5136-PFB Card and Module Identification registers */
      WORD   pfbCardId;             /* 5136-PFB Card ID (0xaad0) */
      WORD   pfbModId;              /* PFBPROFI Module ID   (0xbb01 or 0xbb03) */
      WORD   pfbModVer;             /* PFBPROFI Module Version (ex. 0x0102 = 1.02) */
} PFB_CARD_STS;


/* definitions related to pfbCommand */

CMD_OFF                     0xE0     /* PFB - card offline ready to take commands */
CMD_ON                      0xE1     /* PFB - card is online ready to take offline
                                     command */

CMD_COM_CFG                 0xE2     /* PFB - card is being configured from serial
                                     port */

CMD_ERROR                   0xEF     /* PFB - card is in error, status contains error
                                     code */

CMD_GO_ON                   0x01     /* HOST - card should now go on line */
CMD_GO_OFF                  0x02     /* HOST - card should now go offline, or
                                     abort configuration */

CMD_REINIT                  0x03     /* HOST - card should reinitialize memory
                                     and all parameters */

CMD_CLR_CFG_BUF             0x05     /* HOST - card should check network parameters,
                                     and assign defaults */

CMD_CPY_MAS_CFG             0x06     /* HOST - card should copy a page of
                                     configuration from pfbBinCfgPage */

CMD_AUTO_BAUD_DET           0x07     /* HOST - card should do an automatic baud
                                     detect  */

CMD_MAS_ASIGN_ADDR          0x08     /* HOST - assign and fill in data address
                                     (page/offset) for DP master */

CMD_AUTODP_CFG              0x09     /* HOST - configure dp master using online
                                     auto-configuration */

CMD_CFG_ABF_SHRAM           0x0F     /* HOST - configure DP master from ABF binary
                                     previously copied */
```

```
CMD_CFG_2BF_SHRAM           0x10     /* HOST - configure DP master from ET200 binary
                                     previously copied  */

CMD_CFG_FROM_FLASH          0x11     /* HOST - configure card from configuration in
                                     flash  */

CMD_CFG_FLASH_GO_ON         0x14     /* HOST - configure card from flash then on
                                     line */

CMD_PGM_TO_FLASH            0x21     /* HOST - burn card configuration into flash */
CMD_PGM_SID_FLASH           0x22     /* HOST - burn special id (SST only interface) */
CMD_GET_SID_FLASH           0x23     /* HOST - get special id (SST only interface)  */
CMD_ERR_ACK                 0xFF     /* HOST - acknowledge offline error (online
                                     errors cannot be acknowledged) */


/* definitions related to pfbStatus */

STS_NO_ERROR                0x00     /* last command executed successfully  */
STS_BAD_CMD                 0x01     /* invalid, non supported command */


STS_BAD_BAUD                0x02     /* invalid, non supported BAUD rate */
STS_BAD_STN_ADR             0x03     /* invalid, non supported station address */
STS_BAD_HI_STN_ADR          0x04     /* invalid, non supported highest station
                                     address */

STS_BAD_TOK_ROT             0x05     /* token rotation timeout of range */
STS_BAD_SLOT_TME            0x06     /* slot timeout of range */
STS_BAD_IDLE_1              0x07     /* idle time 1 out of range */
STS_BAD_IDLE_2              0x08     /* idle time 2 out of range */
STS_BAD_RDY_TME             0x09     /* ready timeout of range */
STS_BAD_QUI_TME             0x0A     /* quiet timeout of range */
STS_BAD_GAP_UPD             0x0B     /* gap update timeout of range */
STS_BAD_TOK_RETRY           0x0C     /* token retry limit out of range */
STS_BAD_MSG_RETRY           0x0D     /* message retry limit out of range */
STS_BAD_TOK_ERR_LIM         0x0E     /* token error limit out of range */
STS_BAD_RSP_ERR_LIM         0x0F     /* response error limit out of range */
STS_BAUD_DET_ERROR          0x10     /* unable to detect baud rate (no activity
                                     detected) */

STS_CFG_BAD_CHK_PATTERN     0x20     /* binary configuration file corrupted */
STS_CFG_BIN_TOO_SHORT       0x21     /* binary configuration file corrupted */
STS_CFG_BIN_TOO_LONG        0x22     /* binary configuration file corrupted */
STS_CFG_BAD_CHKSUM          0x23     /* binary configuration file corrupted */
STS_CFG_INVALID_CPU_HDR     0x24     /* binary configuration file corrupted */
STS_CFG_INVALID_SLV_REC_TYP 0x25     /* binary configuration file corrupted */
STS_CFG_RX_OVERFLOW         0x26     /* too much Master RX data has been configured
                                     (16k max.) */

STS_CFG_TX_OVERFLOW         0x27     /* too much Master TX data has been configured

                                     (16k max.) */

STS_CFG_DESIG_NAME_TOO_LONG 0x28     /* Nm= parameter, name too long
                                     12 chars max.) */

STS_CFG_DESIG_BAD_ARG       0x29     /* unrecognized argument (Nm=, TX=, RX=, Ch) */
```

```
STS_CFG_INV_RX_OFS          0x2A     /* RX= parameter, invalid offset (0-3FF8h) */
STS_CFG_INV_TX_OFS          0x2B     /* TX= parameter, invalid offset (0-3FF8h) */
STS_CFG_DESIG_OFS_NOT_SPEC  0x2C     /* RX, TX Offsets have been specified for one,
                                        but not all slaves */

STS_CFG_RX_OVERLAP          0x2D     /* RX data of one block overlaps another */
STS_CFG_TX_OVERLAP          0x2E     /* TX data of one block overlaps another */
STS_CFG_INV_LEN             0x2F     /* invalid parameter or check data length */
STS_CFG_MAS_EXT_ALLOC_ERR   0x35     /* out of master extension memory */
STS_CFG_ADDR_OUT_OF_RANGE   0x37     /* out of master extension memory */
STS_CFG_COPY_TABLE_OVERUN   0x38     /* not enough room in copy table */
STS_CFG_AUTOCFG_DONE        0x39     /* The DP master auto-configuration command
                                        is done */

STS_ACFG_STATE_ERR          0x40     /* The DP master auto-configuration command
                                        failed */

STS_CFG_NO_CONFIG           0x30     /* no configuration present to program into
                                        flash */

STS_FLASH_BAD_ID            0x31     /* internal flash error */
STS_FLASH_ERASE_ERR         0x32     /* internal flash error */
STS_FLASH_PROG_ERR          0x33     /* internal flash error */
STS_FLASH_VRFY_ERR          0x34     /* internal flash error */
STS_LAY2M_INV_MAX_LEN       0x36     /* invalid maximum length for L2 message */


/* the following are fatal errors, the card must be reloaded with the firmware
module */

STS_CFG_INTERNAL_ERROR      0x80
STS_OUT_OF_APBS             0x81
STS_HOST_WD_BITE            0x82     /* host did not kick PFB watchdog within
                                        watchdog period */
STS_HEAP_ALLOC_FAIL         0x83
STS_SH_HEAP_ALLOC_FAIL      0x84

STS_NET_ERROR               0x90     /* net error, OPTION_STAY_OFF_ERR set,
                                        card is offline */
```

## 4.1.2 Diagnostic Counters Structure

### 4.1.2.1 Declaration

```
typedef struct
{
/* General Statistics */

BYTE  errLanOffline;            /* LAN encountered errors and went into offline
                                state */

WORD  diagConf;                 /* Total confirmations (to requests from us)
                                (MAS,LAY2,FMS) */

WORD  errNotOk;                 /* Total Not OK confirmations and/or indications
                               (MAS,LAY2,FMS) */

DWORD diagTokHldTime;           /* Actual Instantaneous token hold time in
                                tBit */

DWORD diagMinTokHldTime;        /* Minimum Actual token hold time in tBit */


/* DP Master Block Statistics */

WORD  diagMasterUpdate;         /* Master I/O update cycles completed */
BYTE  errMasErr;                /* Master->DP slave communication errors */
BYTE  errReConfig;              /* Master->DP went offline and had to be
                                reconfigured */

DWORD diagMasScanTime;          /* Instantaneous master scan time in
                                microseconds */

DWORD diagMasMaxScanTime;       /* Maximum master scan time in microseconds */


/* DP Slave Statistics */

WORD  diagSlaveUpdate;          /* Slave updates */
BYTE  errSlvErr;                /* Slave configuration failures */
BYTE  errSlvTout;               /* Slave watchdog timeouts */


/* Layer 2 Message Statistics */

WORD  diagLay2MsgOk;            /* Layer 2 messages sent OK */
BYTE  errLay2MsgNotOk;          /* Layer 2 message errors */
BYTE  errLay2MsgProcOvrn;       /* Layer 2 periodic processing overruns */


/* Layer 2 SAP Statistics */

WORD  diagLay2SapOk;            /* Layer 2 SAP requests processed OK */
BYTE  errLay2SapNotOk;          /* Layer 2 SAP errors */
BYTE  errLay2SapTout;           /* Layer 2 SAP update timeouts */
```

```
/* ASPC2 PROFIBUS controller Statistics */

BYTE  errInvReqLen;             /* invalid request length errors */
BYTE  errFifo;                  /* FIFO overflow errors */
BYTE  errRxOverun;              /* receive overrun errors */
BYTE  errDblTok;                /* double token errors (bad wiring or hardware) */
BYTE  errRespErr;               /* response errors (bad wiring or hardware) */
BYTE  errSyniErr;               /* SYNI errors (bad wiring or hardware) */
BYTE  errNetTout;               /* network timeout errors */
BYTE  errHsa;                   /* Station higher than HSA was heard */
BYTE  errStn;                   /* Duplicate Station Detected */
BYTE  errPasTok;                /* Unable to Pass Token (bad wiring or hardware) */
BYTE  errLasBad;                /* active station list invalid (bad wiring or
                                hardware) */

BYTE  errInternal;              /* internal error */
BYTE  errArg;                   /* internal error argument */
BYTE  errEventOverun;           /* a new event occurred before the last one was
                                cleared */
} PFB_DIAG_CTRS;
```

# 4.2 Station List Structure

### 4.2.1.1 Declaration

```
typedef struct
{
BYTE pfbAckLasChnge;            /* bit 0=1 to acknowledge station list change
                                (card clears) */

BYTE pfbUpdPasv;                /* bit 0=1 to update status of passive stations
                                (card clears) */

BYTE pfbActStnList[128];        /* Active Station list, 1 byte per station
                                - see below */
} PFB_STN_LST;


/* definitions related to pfbActStnList */

LAS_PASSIVE             0x01    /* this station is passive */
LAS_ACTIVE              0x04    /* this station is active */
LAS_CHANGED             0x08    /* status of this station has changed */
```

## 4.2.2 Network Configuration Structure

### 4.2.2.1 Declaration

```
typedef struct
{
/* 5136-PFB --> Host Event and Interrupt control registers */

WORD pfbEvtEna;                 /* Event enable mask */
WORD pfbIntEna;                 /* Event interrupt enable mask */


/* ASPC2 PROFIBUS controller Basic Parameters */

BYTEpfbStnAddr;                 /* PFB Local station address, (0-126) */
BYTE pfbHiStnAddr;              /* highest station address on network,
                                (0-126), 255 - disable */

BYTEpfbActive;                  /* 1=active station, 0=passive station */
BYTE pfbBaud;                   /* network baud rate - see below */
WORD pfbOptions;                /* network options - see below */


/* ASPC2 PROFIBUS controller Bus Parameters (PFB will put in defaults if left
unchanged) */

DWORD pfbTokRotTime;            /* Target token rotation time, 0 - set default value,
                                (256-16,777,215 tBit) */

WORD pfbSlotTime;               /* Slot time, (37-16,383 tBit) */
WORD pfbIdleTime1;              /* Idle time 1, (35-1,023 tBit) */
WORD pfbIdleTime2;              /* Idle time 2, (35-1,023 tBit) */
WORD pfbReadyTime;              /* Ready time, (11-1,023 tBit) */
BYTE pfbGapUpdFact;             /* Gap update factor, (0-255) */
BYTE pfbQuiTime;                /* Time quiet, (0-127 tBit) */


/* ASPC2 PROFIBUS controller Error Handling Parameters */

BYTEpfbTokRetryLimit;           /* Token retry limit, (0-15) */
BYTE pfbMsgRetryLimit;          /* Message retry limit, (0-15) */
BYTE pfbTokErrLimit;            /* Token error limit, (0-255) */
BYTE pfbRespErrLimit;           /* Response error limit, (0-15) */
char pfbLocIdUsrStr[112];       /* Text for the 4 fields to return in the ID
                                response */
} PFB_NET_CFG;


/* definitions related to pfbEvtEna */

EVT_ENA_LAS_CHANGE      0x0001  /* active station list change */
EVT_ENA_BUS_ERROR       0x0002  /* PROFIBUS error */
```

```
/* definitions related to pfbIntEna */

INT_ENA_LAS_CHANGE      0x0001   /* active station list change */
INT_ENA_BUS_ERROR       0x0002   /* PROFIBUS error */
INT_ENA_DP_MAS_EVENT    0x0004   /* DP master event has occurred */
INT_ENA_DP_SLV_EVENT    0x0008   /* DP slave event has occurred */
INT_ENA_LY2M_EVENT      0x0010   /* Layer 2 message event has occurred */
INT_ENA_LY2S_EVENT      0x0020   /* Layer 2 SAP event has occurred */


/* definitions related to pfbBaud */

BAUD_9k6                0
BAUD_19k2               1
BAUD_93k75              2
BAUD_187k5              3
BAUD_500k               4
BAUD_750k               5
BAUD_1m5                6
BAUD_3m                 7
BAUD_6m                 8
BAUD_12m                9


#define BAUD_31k25      10
#define BAUD_45k45      11


/* definitions related to pfbOptions */

OPTION_REPEATER         0x0001   /* 1=repeater on network, 0=no repeater on network */
OPTION_FMS              0x0002   /* 1=fms devices on network, 0=dp only on network */
OPTION_STAY_OFF_ERR     0x0004   /* stay offline if token error limit or msg.
                                    error  limit exceeded */
```

# 4.3 DP Master

## 4.3.1 Master Global Configuration Structure

### 4.3.1.1 Declaration

```
typedef struct
{
BYTE  pfbMasCntrlCfg;           /* Global control for all master blocks –
                                see below */

BYTE  pfbMasCntrlPage;          /* Memory page which contains master block
                                control table - READ ONLY */

BYTE  pfbMasRxPage;             /* Memory page which contains master RX data
                                (from slaves) - READ ONLY */

BYTE  pfbMasTxPage;             /* Memory page which contains master TX data
                                (to slaves) - READ ONLY */

WORD  pfbMasMinIoCycTme;        /* Minimum I/O cycle time in 100us increments
                                (0-6.5535s) */

WORD  pfbMasMaxIoCycTme;        /* Maximum I/O cycle time in 10ms increments
                                (0.01-655.35s) */
} PFB_MAS_GLB_CFG;


/* definitions related to pfbMasCntrlCfg */

PFB_MAS_CTRL_RUN_MODE   0x02    /* scan i/o in RUN mode
        */
PFB_MAS_CTRL_USR_OFS    0x04    /* user defined RX and TX data offsets (no PROFIBUS
                                auto assign) */

PFB_MAS_CTRL_ENABLE     0x08    /* enable master mode on PFB card */
PFB_MAS_CTRL_DIS_LED    0x10    /* disable status led for DP master function */
PFB_MAS_CTRL_HOLD_INTR  0x20    /* hold DP master event interrupt(s) until end
                                of scan */

PFB_MAS_CTRL_EVT_SCAN   0x40    /* generate event (interrupt) at end of scan /*
DONE

PFB_MAS_CTRL_ADDR_      0x80    /* DP master data addresses have been assigned */
ASIGNED
```

## 4.3.2 Master Status Structure

### 4.3.2.1 Declaration

```
typedef struct
{
BYTE masStatus;                 /* Status Register (Host only Reads) - see below */
BYTE masError;                  /* Error indication - see below */
BYTE masEvent;                  /* Event Flags - see below */
BYTE masDiagEvent;              /* Diagnostic Event Flags - see below */
BYTE masExtErrInfo;             /* Extended error */
} PFB_MAS_STS;


/* definitions related to masStatus */

MAS_STS_OK              0x80    /* current status of this master block is OK */


/* definitions related to masError */

MAS_ERR_CFG_FAILURE     0x01    /* failure while trying to configure slave */
MAS_ERR_SLV_ID_         0x02    /* slave real ID does not match slave's configured
MISMATCH                        ID */

MAS_ERR_DATA_UPD_       0x03    /* frame delivery problem while updating slave
FAILURE                         data */

MAS_ERR_CFG_DIAG_READ_  0x04    /* frame delivery problem while reading slave
FAILURE                         diagnostics */

MAS_ERR_CFG_DIAG        0x05    /* error in diagnostic status byte #1 during
STS1_ERR                        configure */

MAS_ERR_CFG_DIAG_       0x06    /* error in diagnostic status byte #2 during
STS2_ERR                        configure */

MAS_ERR_UPD_DIAG_       0x07    /* error in diagnostic status byte #1 during
STS1_ERR                        diagnostic read /*

MAS_ERR_UPD_DIAG_       0x08    /* error in diagnostic status byte #2 during
STS2_ERR                        diagnostic read */

MAS_ERR_CFG_STN_        0x09    /* station address from diagnostic read does not
MISMATCH                        match */

MAS_ERR_IO_CYC_TOUT     0x0a    /* timeout waiting for i/o update */
MAS_ERR_SLV_WD_OFF      0x0b    /* **warning slave watchdog is not enabled */
```

```
/* definitions related to masEvent */

MAS_EVT_UPD           0x01      /* slave has been updated */
MAS_EVT_RX_DATA_CHG   0x02      /* RX data has changed */


/* definitions related to masDiagEvent */

MAS_DEVT_DIAG_UPD     0x01      /* slave diagnostics have been updated */
```

# 4.4 Master Configuration Structure

### 4.4.1.1 Declaration

```
typedef struct
{
BYTE masStn;                    /* station address of slave, (0-126) */
BYTE masCntCfg;                 /* Control and configuration register - see below */
WORD masRxDataOfs;              /* Data received from slave offset within memory
                                page */

WORD masTxDataOfs;              /* Data to be sent to slave offset within memory
                                page */

BYTE masRxDataLen;              /* Data received from slave length in bytes */
BYTE masTxDataLen;              /* Data to be sent to slave length in bytes */
BYTE masSiemType;               /* SIEMENS Device Type - see below */
char masDesig[13];              /* slave designation (text) */
} PFB_MAS_CFG;


/* definitions related to masCntCfg */

MAS_CTL_IGNORE_STS      0x01    /* ignore status of this master block */
MAS_CTL_EVT_RX_CHG      0x02    /* generate event (interrupt) when RX data from slave
                                changes */

MAS_CTL_RX_BYTE_SWAP    0x04    /* receive byte swap */
MAS_CTL_EVT_UPDTE       0x08    /* generate event (interrupt) when slave update is
                                complete */

MAS_CTL_FAIL_SAFE       0x10    /* slave is a fail safe slave */
MAS_CTL_TX_BYTE_SWAP    0x40    /* reserved */
MAS_CTL_ENABLE          0x80    /* master enable block */


/* definitions related to masSiemType */

MAS_SIEM_TYP_OLD_DP     0x80    /* old type of SIEMENS module */
```

## 4.4.2 DP Configuration Check Structure

### 4.4.2.1 Declaration

```
typedef struct
{
BYTE dpChkLen;                  /* length of configuration check data */
                                /* Configuration check to slave length in bytes */
       BYTE dpChk[244];         /* Configuration Check values from master
                                (32 bytes) */

                                /* Configuration check values to slave (128 bytes) */
} PFB_DP_CHK_CFG;
```

# 4.5 DP Diagnostic Information Structure

### 4.5.1.1 Declaration

```
typedef struct
{
BYTE dpSts1;                    /* status byte 1 to master */
                                /* status byte 1 from slave */

BYTE dpSts2;                    /* status byte 2 to master */
                                /* status byte 2 from slave */

BYTE dpSts3;                    /* status byte 3 to master */
                                /* status byte 3 from slave */

BYTE dpMasStn;                  /* Station that configured Slave */
                                /* Station that configured Slave */

BYTE dpID_hi;                   /* ID value to master hi byte (default 0x67) */
                                /* ID hi byte sent back from slave */

BYTE dpID_lo;                   /* ID value to master low byte (default 0x15) */
                                /* ID low byte sent back from slave */

BYTE dpDiagLen;                 /* Length of diagnostics to master */
                                /* Diagnostic from slave length in bytes */

BYTE dpDiag[244];               /* Diagnostics to master */
                                /* vendor defined diagnostic information from
                                slave */
} PFB_DP_DIAG_INFO;
```

## 4.5.2 DP Parameter Data Structure

### 4.5.2.1 Declaration

```
typedef struct
{
BYTE dpParmLen;                 /* length of parameters from master */
                                /* Parameters to slave length in bytes */

BYTE dpMasSts;                  /* status byte from master */
                                /* status byte to slave */

BYTE dpWdFact1;                 /* Watchdog factor 1 from master */
                                /* Watchdog factor 1 to slave */

BYTE dpWdFact2;                 /* Watchdog factor 2 from master */
                                /* Watchdog factor 2 to slave */

BYTE dpReadyTime;               /* Response delay time (tBit) from master */
                                /* Response delay time (tBit) to slave */

BYTE dpMasID_hi;                /* ID value from master (hi byte) */
                                /* ID value to slave hi */

BYTE dpMasID_lo;                /* ID value from master (low byte) */
                                /* ID value to slave low */

BYTE dpGrpId;                   /* Group ID value from master */
                                /* Group ID value for slave (not supported,
                                always 0) */

BYTE dpParm[237];               /* parameters from master (237 bytes) */
                                /* parameters to slave (237 bytes) */
} PFB_DP_PARM_DATA;
```

# 4.6 Layer 2 Message

## 4.6.1 Layer 2 Message Configuration Structure

### 4.6.1.1 Declaration

```
typedef struct
{
BYTE  lay2mCntCfg;              /* Control and configuration register - see below */
WORD  lay2mUpdTime;             /* update interval for periodic * 1ms (1-16380,
                                0=cyclic) */

WORD  lay2mErrTime;             /* retry interval for periodic if error occurs * 1ms
                                (1-6380) default: 0 - no retry */

WORD  lay2mRxDataOfs;           /* receive data (from response) offset within Layer 2
                                data memory page */

WORD  lay2mTxDataOfs;           /* transmit data (request) offset within Layer 2 data
                                memory page */

BYTE  lay2mRxDataPage;          /* receive data (from response) data memory page */
BYTE  lay2mTxDataPage;          /* transmit data (request) data memory page */
} PFB_L2MSG_CFG;


/* definitions related to lay2mCntCfg */

LAY2M_CTL_PERIODIC     0x01     /* set periodic messages */
LAY2M_CTL_RETRY_       0x02     /* if error set retry periodic */
PERIODIC

LAY2M_CTL_HI_PRI       0x04     /* set high priority for message */
LAY2M_CTL_EVT_RX_CHG   0x08     /* generate event (interrupt) when RX data to this
                                message changes */

LAY2M_CTL_IGNORE_STS   0x10     /* ignore status of this message block (all_ok, LED,
                                and event) */

LAY2M_CTL_EVT_CONFIRM  0x20     /* generate event (interrupt) when this message is
                                confirmed */

LAY2M_CTL_RX_BYTE_SWAP 0x40     /* receive swap byte */
```

## 4.6.2 Layer 2 Message Status Structure

### 4.6.2.1 Declaration

```
typedef struct
{
BYTE  lay2mState;               /* Current state of message block - see below */
BYTE  lay2mStatus;              /* Status register (Host only Reads) - see below */
BYTE  lay2mError;               /* Error register - see below */
BYTE  lay2mEvent;               /* Events - see below */
BYTE  lay2mRspStatus;           /* Response Status if not OK */
BYTE  lay2mRxLen;               /* actual receive data length in bytes */
} PFB_L2MSG_STS;


/* definitions related to lay2mState */

LAY2M_STE_DISABLE      0x00
LAY2M_STE_IN_CONFIGURE 0x01
LAY2M_STE_ENABLE       0x02
LAY2M_STE_ACTIVE            0x03
LAY2M_STE_DONE         0xFF


/* definitions related to lay2mStatus */

LAY2M_STS_OK               0x80


/* definitions related to lay2mError */

LAY2M_ERR_NOT_OK           0x01
LAY2M_ERR_RX_LEN           0x02
LAY2M_ERR_TX_LEN           0x03


/* definitions related to lay2mEvent */

LAY2M_EVT_CONFIRM          0x01
LAY2M_EVT_RX_DATA_CHG      0x02
```

# 4.7 Layer 2 Message Transmit Structure

### 4.7.1.1 Declaration

```
typedef struct
{
BYTE  lay2mDstStn;              /* destination station address (or with 0x80 to
                                enable DstSap) */

BYTE  lay2mDstSap;              /* destination SAP (0-63, 255 - no SAP),
                                default 255 */

BYTE  lay2mSrcSap;              /* source SAP check (0-63, 255 - no SAP),
                                default 255) */

BYTE  lay2mFrmCntrl;            /* frame control byte - see below */
BYTE  lay2mTxLen;               /* transmit data (request) length in bytes (0-244) */
} PFB_L2MSG_TX;


/* definitions related to lay2mFrmCntrl */

FC_SDAl            0x03     /* Send Data with ACK  Low Priority */
FC_SDAh            0x05     /* Send Data with ACK  High Priority */
FC_SDNl            0x04     /* Send Data No ACK   Low Priority */
FC_SDNh            0x06     /* Send Data No ACK   High Priority */
FC_SRDl            0x0C     /* Send and Request Data Low Priority */
FC_SRDh            0x0D     /* Send and Request Data High Priority */
FC_SmTime1         0x00     /* First SM time message */
FC_SmTime2         0x80     /* Second SM time message */
FC_SmSDN           0x02     /* SM Send Data No ACK */
FC_SmSRD           0x01     /* SM Send and Request Data */
FC_SmSRDSltDel     0x0A     /* SM Send and Request Data Slot Del */
FC_SmSRDSltKeep    0x0B     /* SM Send and Request Data Slot Keep */
FC_DdbSRD          0x07     /* DDB Send and Request Data */
FC_DiagSRD         0x08     /* Diagnosis Send and Request Data */
FC_ReqFDL          0x09     /* Request FDL status */
FC_ReqId           0x0E     /* Request ID */
FC_ReqLSAPSts      0x0F     /* Request LSAP Status */
```

# 4.8 Layer 2 SAP

## 4.8.1 Layer 2 SAP Configuration Structure

### 4.8.1.1 Declaration

```
typedef struct
{
BYTE  lay2sStn;                 /* if strict station, accept updates only from this
                                station (0-126) */

BYTE  lay2sSap;                 /* if strict SAP, accept updates only from this SAP
                                (0-63) */

WORD  lay2sCntCfg;              /* Control and configuration register - see below */
WORD  lay2sTimeOut;             /* timeout for SAP * 10ms (1-8190, 0=disable) */
BYTE  lay2sFrmCntrl;            /* if strict FC, accept updates only specified Frame
                                Control values - see below */

WORD  lay2sRxDataOfs;           /* receive data (from request) offset within memory
                                page */

WORD  lay2sTxDataOfs;           /* transmit data (response) offset within memory
                                page */

BYTE  lay2sRxDataPage;          /* receive data (from request) data memory page */
BYTE  lay2sTxDataPage;          /* transmit data (response) data memory page */
} PFB_L2SAP_CFG;


/* definitions related to lay2sCntCfg */

LAY2S_CTL_RX_BYTE_SWAP 0x0004   /* swap hi and low bytes of RX data to this SAP */
LAY2S_CTL_EVT_RX_CHG   0x0008   /* generate event (interrupt) when RX data to this
                                SAP changes */

LAY2S_CTL_IGNORE_STS   0x0010   /* ignore status of this SAP block (all_ok flag,
                                LED and event) */

LAY2S_CTL_EVT_UPDTE    0x0020   /* generate event (interrupt) when this SAP is
                                updated (Indication) */


/* definitions related to lay2sFrmCntrl */

LAY2S_FC_ALL           0x00     /* accept all requests */
LAY2S_FC_SDN_LO        0x01     /* accept only SDN low priority */
LAY2S_FC_SDN_HI        0x02     /* accept only SDN high priority */
LAY2S_FC_SDN_LO_HI     0x03     /* accept only SDN high or low priority */

LAY2S_FC_SDA_LO        0x05     /* accept only SDA low priority */
LAY2S_FC_SDA_HI        0x06     /* accept only SDA high priority */
```

```
LAY2S_FC_SDA_LO_HI      0x07     /* accept only SDA high or low priority */
LAY2S_FC_SRD_LO         0x09     /* accept only SRD low priority */
LAY2S_FC_SRD_HI         0x0a     /* accept only SRD high priority */
LAY2S_FC_SRD_LO_HI      0x0b     /* accept only SRD high or low priority */
LAY2S_FC_DDB_REQ        0x0c     /* DDB Request */
LAY2S_FC_DDB_REQ_LO     0x0d     /* DDB Request low priority */
LAY2S_FC_DDB_REQ_HI     0x0e     /* DDB Request high priority */
LAY2S_FC_DDB_REQ_LO_HI  0x0f     /* DDB Request low and high priority */
```

# 4.9 Layer 2 SAP Status Structure

### 4.9.1.1 Declaration

```
typedef struct
{
BYTE  lay2sStn;                  /* if strict station, accept updates only from this
                                 station (0-126) */

BYTE  lay2sSap;                  /* if strict SAP, accept updates only from this SAP
                                 (0-63) */

BYTE  lay2sSrcSap;
BYTE  lay2sStatus;               /* Status register (Host Reads Only) - see below */
BYTE  lay2sError;                /* Error register - see below */
BYTE  lay2sEvent;                /* Events - see below */

BYTE  lay2sSrcStn
BYTE  lay2sRspStatus;            /* Response Status if NOT_OK */
BYTE  lay2sRxLen;                /* actual receive data length in bytes */
} PFB_L2SAP_STS;


/* definitions related to lay2sStatus */

LAY2S_STS_OK           0x80


/* definitions related to lay2sError */

LAY2S_ERR_NOT_OK       0x01
LAY2S_ERR_TIME_OUT     0x02
LAY2S_ERR_RX_LEN       0x03
LAY2S_ERR_TX_LEN       0x04
LAY2S_ERR_BAD_PARAM    0x05


/* definitions related to lay2sEvent */

LAY2S_EVT_UPDATE       0x01
LAY2S_EVT_RX_DATA_CHG  0x02
```

# 4.10 DP Slave

## 4.10.1 Slave Configuration Structure

### 4.10.1.1 Declaration

```
typedef struct
{
WORD slvCntCfg;                 /* Control/configuration for DP slave function - see
                                below */

BYTE slvRxDataLen;              /* Receive data length (data from master), (0-244) */
BYTE slvTxDataLen;              /* Transmit data length (data to master) , (0-244) */
} PFB_SLV_CFG;


/* definitions related to slvCntCfg */

SLV_CTL_DIAG_UPD        0x0001  /* request diagnostic read from master */
SLV_CTL_EVT_RX_CHG      0x0002  /* generate event (interrupt) when RX data to slave
                                changes */

SLV_CTL_FORCE_READY_    0x0004  force response time (pfbReadyTime) and ignore what
TIME                            the master sends */

SLV_CTL_IGN_SYNC_       0x0008  /* don't generate error if master request sync
FRZ_ERR                         and/or freeze */

SLV_CTL_RX_BYTE_SWAP    0x0010  /* swap upper and lower bytes of RX data */
SLV_CTL_EVT_UPDTE       0x0020  /* generate event (interrupt) when slave is
                                updated */

SLV_CTL_EVT_MODE_       0x0040  /* generate event (interrupt) when slave mode changes
CHANGE                          (master RUN/STOP) */

SLV_CTL_IGNORE_STS      0x0080  /* ignore status of slave (no event) */
SLV_CTL_DIS_LED         0x4000  /* disable status led for DP slave function */
SLV_CTL_ENABLE          0x8000  /* enable PFB to act as DP slave */
```

# 4.11 Slave Status Structure

### 4.11.1.1 Declaration

```
typedef struct
{
WORD slvCntCfg;                 /* Control/configuration for DP slave function -
                                see below */

BYTE slvStatus;                 /* Status for DP slave function (Host Read Only) -
                                see below */

BYTE slvError;                  /* Error indication for DP slave function -
                                see below */

BYTE slvEvent;                  /* Event Flags for DP slave function -
                                see below */

BYTE slvDiagEvent;              /* Diagnostic Event Flags for DP slave function -
                                see below */

BYTE slvReqRxDataLen;           /* Receive data length requested by master */
BYTE slvReqTxDataLen;           /* Transmit data length requested by master */
} PFB_SLV_STS;


/* definitions related to slvCntCfg */

SLV_CTL_DIAG_UPD        0x0001  /* request diagnostic read from master */
SLV_CTL_EVT_RX_CHG      0x0002  /* generate event (interrupt) when RX data to slave
                                changes */

SLV_CTL_FORCE_READY_    0x0004  /* force response time (pfbReadyTime) and ignore
TIME                            what the master ends */

SLV_CTL_IGN_SYNC_       0x0008  /* don't generate error if master request sync and/or
FRZ_ERR                         freeze */

SLV_CTL_RX_BYTE_SWAP    0x0010  /* swap upper and lower bytes of RX data */

SLV_CTL_EVT_UPDTE       0x0020  /* generate event (interrupt) when slave is
                                updated */

SLV_CTL_EVT_MODE_       0x0040  /* generate event (interrupt) when slave mode changes
CHANGE                          (master run/stop) */

SLV_CTL_IGNORE_STS      0x0080  /* ignore status of slave (no event) */

SLV_CTL_DIS_LED         0x4000  /* disable status led for DP slave function

SLV_CTL_ENABLE          0x8000  /* enable PFB to act as DP slave */
```

```
/* definitions related to slvStatus */

SLV_STS_RUN_MODE        0x40     /* we're being scanned in run mode */
SLV_STS_OK              0x80     /* current slave status is OK */


/* definitions related to slvError */

SLV_ERR_ID_MISM         0x01     /* ID from master does not match configured ID */
SLV_ERR_READY_TIME_     0x02     /* pfbReadyTime does not match what master sent */
MISM

SLV_ERR_UNSUP_REQ       0x03     /* PROFIBUS is requesting Freeze or Sync,
                                    which is not supported */

SLV_ERR_RX_LEN_MISM     0x04     /* length of data from master to us incorrect  */
SLV_ERR_TX_LEN_MISM     0x05     /* length of data from us to master incorrect  */
SLV_ERR_WD_FACT_INV     0x06     /* slvWdFact1 or slvWdFact2 from master was 0  */
SLV_ERR_TIME_OUT        0x07     /* slave watchdog timeout (check response timeout) */
SLV_ERR_WARN_WD_DIS     0x08     /* slave timeout watch dog disabled from master */


/* definitions related to slvEvent */

SLV_EVT_UPD             0x01     /* master has updated us */
SLV_EVT_RX_DATA_CHG     0x02     /* RX data from master has changed */


/* definitions related to slvDiagEvent */

SLV_DEVT_DIAG_UPD       0x01     /* master has read diagnostic information */
```

# 4.12 Master Class II

## 4.12.1 Master Class II Slave Configuration Structure

### 4.12.1.1 Declaration

```
typedef struct
{
BYTE  lay2mCntCfg;              /* Control and configuration register */
WORD  lay2mUpdTime;             /* update interval for periodic * 1ms (1-16380,
                                0=cyclic) */

WORD  lay2mErrTime;             /* retry interval for periodic if error occurs *
                                1ms */

BYTE  lay2mDstStn;              /* destination station address */
BYTE  lay2mDstSap;              /* destination SAP (0xff to disable) */
BYTE  lay2mSrcSap;              /* source SAP (0xff to disable)*/
BYTE  lay2mFrmCntrl;            /* frame control byte */
} PFB_MC2_SLV_CFG;


/* definitions related to lay2mDstSap */

MC2_SLV_SETADDR        55
MC2_SLV_RD_IP          56
MC2_SLV_RD_OP          57
MC2_SLV_RD_CFG         59
MC2_SLV_RD_DIAG        60
```

# 4.13 Master Class II Slave Read Structure

### 4.13.1.1 Declaration

```
typedef struct
{
BYTE  lay2mState;              /* Current state of message block */
BYTE  lay2mStatus;             /* Status register (Host only Reads) */
BYTE  lay2mError;              /* Error register */
BYTE  lay2mEvent;              /* Events */
BYTE  lay2mRspStatus;          /* Response Status if not OK */
BYTE  lay2mRxLen;              /* Length of the response data */
} PFB_MC2_SLV_RD;
```

## 4.13.2 Master Class II Set Slave Address Structure

### 4.13.2.1 Declaration

```
typedef struct
{
BYTE  lay2mState;              /* Current state of message block */
BYTE  lay2mStatus;             /* Status register (Host only Reads) */
BYTE  lay2mError;              /* Error register */
BYTE  lay2mEvent;              /* Events  */
BYTE  lay2mRspStatus;          /* Response Status if not OK */
BYTE  pfbNewSlvAddr;           /* The new slave address */
WORD  pfbSlvProfiID;           /* The slaves profibus ID */
BYTE  pfbSlvNoAddrChg;         /* Prevent future changes before next reset */
BYTE  pfbRemDataLen;           /* Len of the optional data for the slave */
} PFB_MC2_SETSLV_ADDR;
```

# 4.14 Master Class II Master Configuration Structure

### 4.14.1.1 Declaration

```
typedef struct
{
BYTE  mc2CntCfg;                /* The control and configuration options for
                                Master Class II */

WORD  mc2PollTime;              /* The update interval for retries * 1ms (1-16380) */
WORD  mc2PollLimit;             /* The maximum number of retries */
BYTE  mc2DstStn;                /* The destination station address */
} PFB_MC2_MASTER_CFG;


/* definitions related to mc2CntCfg */

MC2_CTL_UNCONF          0x01
MC2_CTL_HI_PRI          0x04
MC2_CTL_EVT_CONFIRM     0x20     /* generate event (intr) when this message is
                                 confirmed */

//Master Class 2 Services Definitions

SYSTEM_DIAGS            0x7E
MASTER_STATUS           0x7F
DATA_XFER_LIST          0x80
MASTER_C1_STOP          0x40
MASTER_C1_CLEAR         0x80
MASTER_C1_ON            0xc0
// Macros
TEST_BITLIST(mem, stn)  mem[stn/8]&(0x01<<(stn-(((unsigned char)(stn/8))*8)))
```

# 4.15 Master Class II Read Master Data Structure

### 4.15.1.1 Declaration

```
typedef struct
{
BYTE  mc2State;                 /*The state of the current transaction */
BYTE  mc2Status;                /* The status of the last transaction */
BYTE  mc2Error;                 /* The last error code */
BYTE  mc2Event;                 /* The last event code */
BYTE  mc2RspSts;                /* The code returned by the Master Class I target */
BYTE  mc2RxLen;                 /* The length of the returned message */
} PFB_MC2_MASTER_RD;


/* definitions related to mc2State */

MC2_STE_DISABLE         0x00
MC2_STE_BUSY            0x01
MC2_STE_ENABLE          0x02
MC2_STE_ACTIVE          0x03
MC2_STE_DONE            0xFF


/* definitions related to mc2Status */

MC2_STS_OK              0x80


/* definitions related to mc2Error */

MC2_ERR_NOT_OK          0x01
MC2_ERR_RX_LEN          0x02
MC2_ERR_TX_LEN          0x03
MC2_ERR_POLL_TOUT       0x04


/* definitions related to mc2Event */

MC2_EVT_CONFIRM         0x01
```

# 4.16 Master Class II Read Block Structure

### 4.16.1.1 Declaration

```
typedef struct
{
BYTE  mc2CntCfg                 /* The control and configuration options for
                                Master Class II */

BYTE  mc2State                  /* The state of the current transaction */
BYTE  mc2Status;                /* The status of the last transaction */
BYTE  mc2Error;                 /* The last error code */
BYTE  mc2Event;                 /* The last event code */
BYTE  mc2RspSts;                /* The code returned by the Master Class I target */
BYTE  mc2TxLen;                 /* The length of the transaction request
                                message buffer */

BYTE  mc2RxLen;                 /* The length of the transaction response
                                message buffer */

WORD  mc2PollTime;              /* The update interval for retries * 1ms (1-16380) */
WORD  mc2PollLimit;             /* The maximum number of retries */
BYTE  mc2DstStn;                /* The destination station address */
} PFB_MC2_MASTER_BLK;
```

## 4.16.2 Master Class II Master Write Structure

### 4.16.2.1 Declaration

```
typedef struct
{
BYTE  mc2State;                 /* The state of the current transaction */
BYTE  mc2Status;                /* The status of the last transaction */
BYTE  mc2Error;                 /* The last error code */
BYTE  mc2Event;                 /* The last event code */
BYTE  mc2RspSts;                /* The code returned by the Master Class I target */
BYTE  mc2TxLen;                 /* The length of the transaction request
                                message buffer */
} PFB_MC2_MASTER_WRT;
```

# A

# Warranty and Support

## Appendix Contents:

- Warranty
- Technical Support

# A.1 Warranty

For warranty information, refer to http://www.mysst.com/warranty.asp.

# A.2 Technical Support

Please ensure that you have the following information readily available before calling for technical support:

- Card type and serial number
- Computer's make, model, CPU speed and hardware configuration (other cards installed)
- Operating system type and version
- Details of the problem you are experiencing: firmware module type and version, target network, and circumstances that may have caused the problem

## A.2.1 Getting Help

Technical support is available during regular business hours by telephone, fax or email from any Woodhead Software & Electronics office, or from http:/www.woodhead.com. Documentation and software updates are also available on the Web site.

**Note**

If you are using the card with a third-party application, refer to the documentation for that package for information on configuring the software for the card.

### North America

Canada:
Tel: +1-519-725-5136
Fax: +1-519-725-1515
Email: WoodheadSupportNA@molex.com

### Europe

France:
Tel: +33 2 32 96 04 22
Fax: +33 2 32 96 04 21
Email: WoodheadIC.SupportEU@molex.com

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Tel: +49 7252 9496 555
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For the most current contact details, please visit http://www.woodhead.com.