

May 22, 2006  
Working Draft



The Printer Working Group

## The Printer Working Group (PWG)

### Printer MIB Alert Table Groups Extension for Multi-Function Devices

Status: Initial Draft

**Abstract:** This document describes an extension to RFC 1759, the Printer MIB, and RFC 3805, the Printer MIB version 2, to provide support of SNMP Alerts in a multi-function device (MFD). An MFD is typically based on a printer mechanism with the addition of a scanner and a Facsimile modem to provide the services of print, copy, and fax.

The SNMP Alert mechanism in the Printer MIB contains a general purpose structure that is linked to printing devices primarily by the group identifiers associated with each table entry. Alert table support for MFD implementations is provided using the new group identifiers defined in this specification.

**Copyright (C) 2005, The Printer Working Group. All rights reserved.**

This document may be copied and furnished to others, and derivative works that comment on, or otherwise explain it or assist in its implementation may be prepared, copied, published and distributed, in whole or in part, without restriction of any kind, provided that the above copyright notice, this paragraph and the title of the Document as referenced below are included on all such copies and derivative works. However, this document itself may not be modified in any way, such as by removing the copyright notice or references to the IEEE-ISTO and the Printer Working Group, a program of the IEEE-ISTO.

Title: The 'mailto' Delivery Method for Event Notifications

The IEEE-ISTO and the Printer Working Group DISCLAIM ANY AND ALL WARRANTIES, WHETHER EXPRESS OR IMPLIED INCLUDING (WITHOUT LIMITATION) ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

The Printer Working Group, a program of the IEEE-ISTO, reserves the right to make changes to the document without further notice. The document may be updated, replaced or made obsolete by other documents at any time.

The IEEE-ISTO takes no position regarding the validity or scope of any intellectual property or other rights that might be claimed to pertain to the implementation or use of the technology described in this document or the extent to which any license under such rights might or might not be available; neither does it represent that it has made any effort to identify any such rights.

The IEEE-ISTO invites any interested party to bring to its attention any copyrights, patents, or patent applications, or other proprietary rights which may cover technology that may be required to implement the contents of this document. The IEEE-ISTO and its programs shall not be responsible for identifying patents for which a license may be required by a document and/or IEEE-ISTO Industry Group Standard or for conducting inquiries into the legal validity or scope of those patents that are brought to its attention. Inquiries may be submitted to the IEEE-ISTO by e-mail at:

ieee-isto@ieee.org.

The Printer Working Group acknowledges that the IEEE-ISTO (acting itself or through its designees) is, and shall at all times, be the sole entity that may authorize the use of certification marks, trademarks, or other special designations to indicate compliance with these materials.

Use of this document is wholly voluntary. The existence of this document does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to its scope.

This document is available electronically at:

<ftp://ftp.pwg.org/pub/pwg/pmp/drafts/wd-mfp-alert-groups10-20060522.pdf> (.doc)

**About the IEEE-ISTO**

The IEEE-ISTO is a not-for-profit corporation offering industry groups an innovative and flexible operational forum and support services. The IEEE-ISTO provides a forum not only to develop standards, but also to facilitate activities that support the implementation and acceptance of standards in the marketplace. The organization is affiliated with the IEEE (<http://www.ieee.org/>) and the IEEE Standards Association (<http://standards.ieee.org/>).

For additional information regarding the IEEE-ISTO and its industry programs visit <http://www.ieee-isto.org>.

**About the IEEE-ISTO PWG**

The Printer Working Group (or PWG) is a Program of the IEEE Industry Standards and Technology Organization (ISTO) with member organizations including printer manufacturers, print server developers, operating system providers, network operating systems providers, network connectivity vendors, and print management application developers. The group is chartered to make printers and the applications and operating systems supporting them work together better. All references to the PWG in this document implicitly mean “The Printer Working Group, a Program of the IEEE ISTO.” In order to meet this objective, the PWG will document the results of their work as open standards that define print related protocols, interfaces, procedures and conventions. Printer manufacturers and vendors of printer related software will benefit from the interoperability provided by voluntary conformance to these standards.

In general, a PWG standard is a specification that is stable, well understood, and is technically competent, has multiple, independent and interoperable implementations with substantial operational experience, and enjoys significant public support.

For additional information regarding the Printer Working Group visit: <http://www.pwg.org>

**Contact information:**

The Printer Working Group  
c/o The IEEE Industry Standards and Technology Organization  
445 Hoes Lane  
Piscataway, NJ 08854  
USA

PMP Web Page:

<http://www.pwg.org/pmp/>

PMP Mailing List:

[pmp@pwg.org](mailto:pmp@pwg.org)

Instructions for subscribing to the PMP mailing list can be found at the following link:

<http://www.pwg.org/mailhelp.html>

Implementers of this specification are encouraged to join the PMP Mailing List in order to participate in any discussions of the specification. Suggested additions, changes, or clarification to this specification, should be sent to the PMP Mailing list for consideration.

## Table of Contents

1	Introduction .....	5
2	Terminology .....	5
3	Model .....	5
3.1	Scanner Model .....	5
3.1.1	Scanner Media Path Group.....	5
3.1.2	Scanner Optical System Group .....	6
3.1.3	Scanner Transformatter Group.....	6
3.1.4	Scanner Output Channel Group .....	6
3.1.5	Scanner Input Channel Group .....	6
3.1.6	Scanner Console Group .....	6
3.1.7	Scanner Covers Group.....	6
3.2	Fax Model .....	6
3.2.1	Fax Modem Group .....	6
3.2.2	Fax Control/Data Channel Group .....	6
3.2.3	Fax Console Group .....	7
4	MFP Alert Groups .....	7
4.1	Scanner Alert Groups .....	7
4.2	Fax Module Alert Groups .....	7
5	IANA Considerations .....	7
6	Internationalization Considerations .....	8
7	Security Considerations .....	9
8	References .....	9
8.1	Normative References .....	9
8.2	Informative References .....	9
9	Author's Addresses .....	9
10	MFP Faults Analysis (Informative) .....	9
10.1	Possible Scanner Faults .....	9
10.1.1	For scannerDevice(50): .....	9
10.1.2	For scannerMediaPath(51):.....	9
10.1.3	For scannerOpticalSystem(52): .....	10
10.1.4	For scannerTransformatter(53):.....	10
10.1.5	For scannerOutputChannel(54): .....	10
10.1.6	For scannerInputChannel(55):.....	10
10.1.7	For scannerControlPanel(56): .....	10
10.1.8	For scannerCovers(57): .....	10
10.2	Possible Fax Faults .....	10
10.2.1	For faxDevice(70): .....	10
10.2.2	For faxModem(71): .....	10
10.2.3	For faxCtrlDataChannel(72): .....	10
10.2.4	For faxConsole(73): .....	10

# 1 Introduction

Multi-function devices are now very popular in office environments as an alternative to providing separate printer, copier, and facsimile equipment. The multi-function device is typically a lower cost purchase, when compared to the equivalent individual devices, and has the additional advantage of occupying much less valuable office space.

The printer portion of the multi-function device becomes the central component for the print, copy, and fax functions. The addition of a scanner component completes the requirements to provide the copier functionality. To include the ability to transmit and receive facsimile documents requires only the addition of a fax modem and a PSTN interface.

The Printer Working Group (PWG) has previously developed an extensive SNMP Management Information Base (MIB) for printer devices, which is included in practically every network printer sold today. This MIB includes an Alert Table, that may be used with or without SNMP traps, to implement an effective error reporting system. Many printer vendors have leveraged use of the Printer MIB to create private printer management applications with error logging and reporting facilities.

To further enhance the capabilities of these private management applications, extensions to the Printer MIB groups are defined in this specification to support the additional mechanisms in a multi-function device. Following the approval of this document, the PWG will register these new groups in the IANA registry for PrtAlertGroupTC.

## 2 Terminology

This section defines the following terms that are used throughout this document:

This document uses the same terminology as defined in the Printer MIB v2 Specification RFC 3805 [RFC3805], such as "status", "alerts", "interpreters", "console", and "interfaces". Capitalized terms, such as MUST, MUST NOT, REQUIRED, SHOULD, SHOULD NOT, MAY, NEED NOT, and OPTIONAL, have special meaning relating to conformance as defined in RFC 2119 [RFC2119] and RFC 3805 section 1.5. If an implementation supports the extension defined in this document, then these terms apply; otherwise, they do not. These terms define conformance to this document only; they do not affect conformance to other documents, unless explicitly stated otherwise.

## 3 Model

This section extends the abstract Printer Model described in RFC 3805, section 2, to include the Scanner and Fax modules. No changes to the Printer Model are intended by this specification.

### 3.1 Scanner Model

The Scanner model contains seven parts: Media Path, Optical System, Transformatter, Output Channel, Input Channel, Console, and Covers.

#### 3.1.1 Scanner Media Path Group

The Scanner Media Path defines the characteristics and status of the document feeder mechanism and the path through the scanner to the output tray. The two primary media path types are auto feed and manual.

The Auto Feed Media Path consists of an input tray, an output tray, and a transport mechanism to move the media from the input tray to the Scanner Optical System and then to the output tray. An Auto Feed Media Path may include paper jam sensors in addition to motor control error detection.

A Manual Feed Media Path requires each sheet scanned to be manually inserted into the optical reader mechanism. Since there is no mechanized media movement, no sensors or motors are included.

### **3.1.2 Scanner Optical System Group**

The Scanner Optical System includes the light source(s) and sensor(s) used to obtain the image from the source media. Status conditions for this group may include the state of the light source (on, off, warmup, standby, etc.) as well as a media present indicator. Error conditions may be provided to indicate a failed light source and/or a malfunctioning light sensor.

### **3.1.3 Scanner Transformatter Group**

The Scanner Transformatter is the control function used to convert the output from the optical sensor into a standard data format. Example data formats are TIFF, PDF, MH, MR, MMR, run length encoding, etc. Status information may define the selected format, from the available set, as well as the current state (processing, waiting for input, transmitting, etc.).

### **3.1.4 Scanner Output Channel Group**

The Scanner Output Channel provides the communication path from the scanner system to the central control unit of the multi-function device. The primary purpose of the output channel is for the transmission of the scanned image data from the scanner to the central control unit. The transmission protocol used on this channel may be defined by an industry standard or by a private specification. Since this channel is not expected to be available externally, use of a publicly available standard does not provide any user advantage.

### **3.1.5 Scanner Input Channel Group**

The Scanner Input Channel provides the communication path between the central control unit and the scanner system of the multi-function device to transfer control information. As with the output channel, the transmission protocol used on this channel may be defined by an industry standard or by a private specification.

### **3.1.6 Scanner Console Group**

The Scanner Console Group defines the control functions and indicators available to the operator or user at the multi-function device. The console may be contained on a module that is dedicated to the scanner or on a module containing support for more than one part of the device.

### **3.1.7 Scanner Covers Group**

The Scanner Covers Group provides the information concerning the any interlocks coupled with covers, panels, or doors associated with the scanner.

## **3.2 Fax Model**

The Fax model contains three parts: Fax Modem, Control/Data Channel, and Console.

### **3.2.1 Fax Modem Group**

The Fax Modem Group defines the characteristics and status of the facsimile modem and the associated PSTN interface.

### **3.2.2 Fax Control/Data Channel Group**

The Fax Control/Data Channel provides a bidirectional communication path between the central control unit and the Fax Modem of the multi-function device to transfer control and data information. The transmission protocol and data formats used on this channel may be defined by a vendor private specification.

### 3.2.3 Fax Console Group

The Fax Console Group defines the control functions and indicators available to the operator or user at the multi-function device. The console may be contained on a module that is dedicated to the Fax Modem or on a module containing support for more than one part of the device.

## 4 MFP Alert Groups

The new MFP alert groups and the associated alert group codes are defined in this section.

### 4.1 Scanner Alert Groups

- 50. Scanner General Group
- 51. Scanner Media Path Group
- 52. Scanner Optical System Group
- 53. Scanner Transformatter Group
- 54. Scanner Output Channel Group
- 55. Scanner Input Channel Group
- 56. Scanner Console Group
- 57. Scanner Covers Group

### 4.2 Fax Module Alert Groups

- 70. Fax Module General Group
- 71. Fax Modem Group
- 72. Fax Control/Data Channel Group
- 73. Fax Console Group

## 5 IANA Considerations

This section contains the exact registration information for IANA to add to the PWG PrtAlertGroupTC Registry, according to the procedures defined in RFC 3805 [RFC3805] section ?, to cover the new group definitions defined in this document.

```
PrtAlertGroupTC ::= TEXTUAL-CONVENTION
    -- Values in the range 1 to 29 must not be IANA-assigned without
    -- re-publishing Printer MIB.
    -- Values of 30 and greater are for use in MIBs that augment
    -- the Printer MIB, such as the Finisher MIB.
    -- This TC extracted from prtAlertGroup in RFC 1759.

STATUS      current
DESCRIPTION
    "The type of subunit within the printer model that this alert
    is related.  Input, output, and markers are examples of
    printer model groups, i.e., examples of types of subunits.
    Wherever possible, the enumerations match the sub-identifier
    that identifies the relevant table in the Printer MIB.

    NOTE: Alert type codes have been added for the Host Resources
    MIB storage table and device table.  These additional types
    are for situations in which the printer's storage and device
    objects must generate alerts (and possibly traps for critical
    alerts)."
```

```
SYNTAX      INTEGER {
```

```
    other(1),
    unknown(2),
-- Values for Host Resources MIB
    hostResourcesMIBStorageTable(3),
    hostResourcesMIBDeviceTable(4),
-- Values for Printer MIB
    generalPrinter(5),
    cover(6),
    localization(7),
    input(8),
    output(9),
    marker(10),
    markerSupplies(11),
    markerColorant(12),
    mediaPath(13),
    channel(14),
    interpreter(15),
    consoleDisplayBuffer(16),
    consoleLights(17),
    alert(18), -- Not in RFC 1759
-- Values (5) to (29) reserved for Printer MIB
-- Values for Finisher MIB
    finDevice(30), -- Not in RFC 1759
    finSupply(31), -- Not in RFC 1759
    finSupplyMediaInput(32), -- Not in RFC 1759
    finAttribute(33), -- Not in RFC 1759
-- Values (30) to (39) reserved for Finisher MIB
-- Values for the Scanner MIB
    scannerDevice(50), -- MFP Extension
    scannerMediaPath(51), -- MFP Extension
    scannerOpticalSystem(52), -- MFP Extension
    scannerTransformer(53), -- MFP Extension
    scannerOutputChannel(54), -- MFP Extension
    scannerInputChannel(55), -- MFP Extension
    scannerConsole(56), -- MFP Extension
    scannerCovers(57), -- MFP Extension
-- Values (50) to (69) reserved for the scanner MIB
-- Values for the Fax MIB
    faxDevice(70), -- MFP Extension
    faxModem(71), -- MFP Extension
    faxCtrlDataChannel(72), -- MFP Extension
    faxConsole(73) -- MFP Extension
-- Values (70) to (79) reserved for the Facsimile MIB
}
```

## 6 Internationalization Considerations

The Printer MIB Alert Group Extensions defined in this document present no internationalization considerations beyond those covered in the Printer MIB v2 Specification [RFC3805], section 2.2.1.1.



## 7 Security Considerations

The Printer MIB Alert Group Extensions defined in this document present no additional security considerations for the Printer MIB beyond those currently covered in the Printer MIB v2 Specification [RFC3805], section 9.

## 8 References

### 8.1 Normative References

[RFC2119]

Key words for use in RFCs to Indicate Requirement Levels, RFC 2119, Bradner. March 1997.

[RFC3805]

IETF Printer MIB v2, RFC 3805, Bergman, Lewis, McDonald. June 2004.

### 8.2 Informative References

[RFC1759]

IETF Printer MIB, RFC 1759, Smith, Wright, Hastings, Zilles, Gyllenskog. March 1995. (obsoleted by [RFC3805]).

## 9 Author's Addresses

### Ron Bergman

Ricoh Printing Systems America  
2635 Park Center Drive  
Simi Valley, CA 93065

Phone: 805-578-4421

Fax: 805-578-4005

e-mail: Ron.Bergman@rpsa.ricoh.com

## 10 MFP Faults Analysis (Informative)

An analysis of the possible faults that may occur, with respect to the MFP Alert Group Extensions defined in this specification, are presented as a guide for implementers. The intent of this section is to demonstrate the use of currently defined alert codes for typical error conditions that may be encountered for the MFP Alert Groups. This section is not intended to be a specification as to what alert codes must be indicated or to provide a list of all possible error conditions.

### 10.1 Possible Scanner Faults

#### 10.1.1 For scannerDevice(50):

Powered Off	subunitTurnedOff(21) / powerDown(504)
Powered Up	subunitTurnedOn(20) / powerUp(503)
Off Line	subunitOffline(22)
General Error	other(1)

#### 10.1.2 For scannerMediaPath(51):

Paper Jam	jam(8)
-----------	--------

**10.1.3 For scannerOpticalSystem(52):**

No Sensor Output	subunitUnrecoverableFailure(30)
Invalid Sensor Output	subunitRecoverableFailure(29)
Lamp Failure (no output)	subunitLifeOver(11)
Lamp Missing	subunitMissing(9) / subunitRemoved(26)
Motor Failure	subunitMotorFailure(33)

**10.1.4 For scannerTransformatter(53):**

General Error	other(1)
---------------	----------

**10.1.5 For scannerOutputChannel(54):**

Channel Failure	subunitRecoverableFailure(29) / subunitUnrecoverableFailure(30)
-----------------	---

**10.1.6 For scannerInputChannel(55):**

Channel Failure	subunitRecoverableFailure(29) / subunitUnrecoverableFailure(30)
-----------------	---

**10.1.7 For scannerCosole(56):**

General Error	other(1)
---------------	----------

**10.1.8 For scannerCovers(57):**

Interlock Active	coverOpen(3) / coverClosed(4) / interlockOpen(5) / interlockClosed(6)
------------------	---

**10.2 Possible Fax Faults****10.2.1 For faxDevice(70):**

Powered Off	subunitTurnedOff(21) / powerDown(504)
Powered Up	subunitTurnedOn(20) / powerUp(503)
Off Line	subunitOffline(22)
General Error	other(1)

**10.2.2 For faxModem(71):**

General Error	other(1)
Modem Failure	subunitRecoverableFailure(29) / subunitUnrecoverableFailure(30)

**10.2.3 For faxCtrlDataChannel(72):**

General Error	other(1)
Channel Input Failure	subunitRecoverableFailure(29) / subunitUnrecoverableFailure(30)
Channel Output Failure	subunitRecoverableFailure(29) / subunitUnrecoverableFailure(30)

**10.2.4 For faxConsole(73):**

General Error	other(1)
---------------	----------