ANT+ Common Pages

Copyright Information and Usage Notice

Revision History

Revision	Effective Date	Description
1.0	May 2008	Official Customer Release
1.1	July 2008	Updated Format, changed reserved fields to value = 0xFF
1.2	February 2009	Added new Pages 70, 83,and 84
1.3	February 2010	Extended Page 70 Use Added Dynamic Profile Pages
2.0	March 2010	Reformat Added ANT-FS beacon, ping, disconnect pages Added Request ANT-FS command type (page 70)
2.1	February 2011	Edited 'Copyright Information and Usage Notice' section
2.2	January 2012	Added command status and command burst (Page 71 and 72) Added FIT Broadcast pages
2.3	June 2012	Added Memory Level and Paired Devices Data Pages
2.4	July 2013	Updated Battery Status Page and Product Information Page (SW revision) Updated document template.
3.0	August 2016	Added Value = 3, 4 options to last row Table 6.3 Table 6-4, added descriptions to Command Status Values Updated Table 5-2, removed shared channel bytes 6-3 Changed Byte 1 and 2 values 6.2 Added master – slave (broadcast only) recommendation Added 6.2.7 Requesting data page from a slave Updated Manufacturer ID Description to refer to the list found in the FIT Add Mode Settings Page (0x4C) Add 0x04 for requesting page set Add equations for calculating SW Revision (Product Info Page) Remove FIT over Broadcast Add DP 87 – error message Add DP 78, 79 – Multi-component Man ID and Product Info Add DP 74 – Open Channel Command Update Man specific page range Add toggle-bit device man specific page range
3.1	October 2016	Remove command burst page Add new sub pages Add a paragraph explaining that data page requests interrupt transmission

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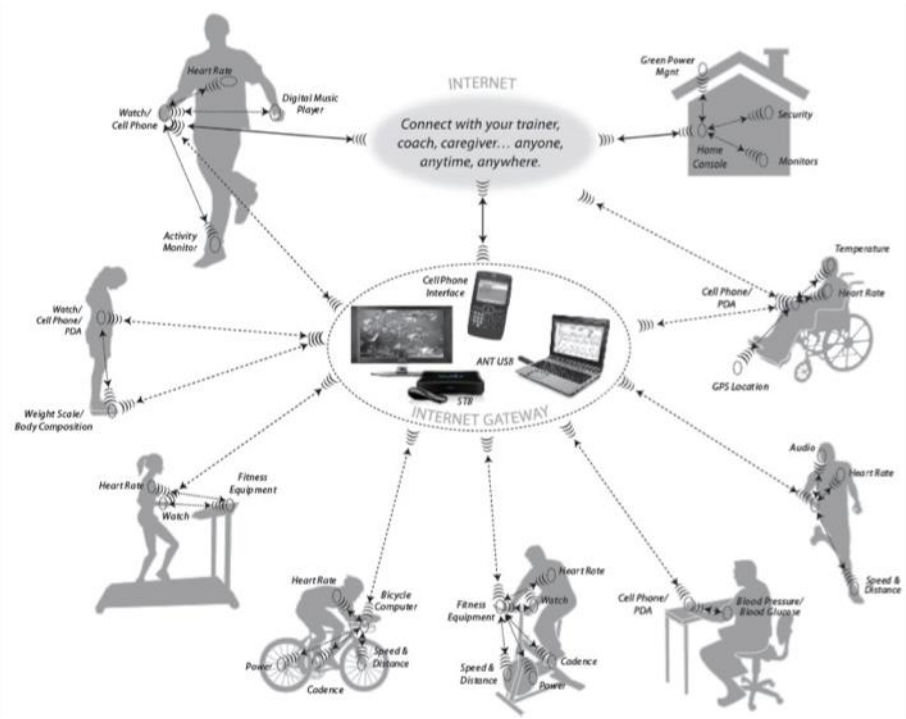
1 Overview of ANT+

The ANT+ Managed Network is comprised of a group of devices that use the ANT radio protocol and ANT+ Device Profiles to determine and standardize wireless communication between individual devices. This management of device communication characteristics provides interoperability between devices in the ANT+ network.

Developed specifically for ultra low power applications, the ANT radio protocol provides an optimal balance of RF performance, data throughput and power consumption.

ANT+ Device Profiles have been developed for devices used in personal area networks and can include, but are not limited to, devices that are used in sport, fitness, wellness, and health applications. Wirelessly transferred data that adheres to a given device profile will have the ability to interoperate with different devices from different manufacturers that also adhere to the same standard. Within each device profile, a minimum standard of compliance is defined. Each device adhering to the ANT+ Device Profiles must achieve this minimum standard to ensure interoperability with other devices.

Figure 1-1. ANT+ Device Ecosystem



This document details the wireless communication between devices adhering to this ANT+ Device Profile. The typical use case of the device(s), wireless channel configuration, data format(s), minimum compliance for interoperability, and implementation guidelines are also detailed.

IMPORTANT:

If you have received this document you have agreed to the terms and conditions of the Adopter's Agreement and have downloaded the ANT+ Managed network key. By accepting the Adopter's Agreement and receiving the ANT+ device profiles you agree to:

- **Implement and test your product to this specification in its entirety**
- **To implement only ANT+ defined messages on the ANT+ managed network**

2 Related Documents

Refer to current versions of the listed documents. To ensure you are using the current versions, check the ANT+ website at www.thisisant.com or contact your ANT+ representative.

1. ANT Message Protocol and Usage
2. ANT File Share (ANT-FS) Technical Specification
3. Flexible & Interoperable File Transfer (FIT) Protocol

In addition, many of the ANT+ Device Profiles use ANT+ common data pages in a way that is tailored to the specific use case addressed by each profile. New profiles are constantly being developed and are made available on the ANT+ website.

3 Introduction

The ANT protocol supports three different types of networks: public, private, and managed. In each of these networks the data payload, channel parameters, and network keys are defined differently. In all of these networks there are certain data messages that most devices want to send that are not specific to a given device. For example, most battery operated devices need to be able to send the state of the battery in use and have the ability to transmit alerts when the battery gets into a critical state.

ANT and the ANT+ Alliance have created common data formats, called common data pages, which can be used by any device on any of the ANT networks. The ability to send and receive these common pages is defined in the transmission type of the ANT channel. For more information on the definition of transmission type, please refer to the ANT Message Protocol and Usage document. Whether the channel parameters are defined by the ANT+ Alliance for managed networks, or defined by a private company on a private network, common pages may be used if desired.

This document describes the different types of data pages that have been defined: device profile/sensor specific pages, common pages common to any ANT/ANT+ device, as well as data pages for manufacturer specific information. In particular, this document describes the common pages used by ANT+ devices. As such, not all defined common data pages (i.e. for non-ANT+ specific ANT devices) are described in this document.

If additional data page formats are desired, please contact the ANT+ Alliance at ANTAlliance@thisisant.com to discuss development and future inclusion in this document.

4 Numbering of Data Pages

Common data pages use the first byte of the 8 byte ANT data payload to indicate a page number. Page numbers have been assigned to enable their use in all ANT+ or ANT networks (Table 4-1).

Table 4-1. Common Data Page Numbers

Page Number	Description
0x00 – 0x3F (0 – 63)	**ANT+ Alliance Device Type Specific** These pages are reserved for specific device types to be defined by the ANT+ Alliance. Each device type will define its own data pages in this range.
0x40 – 0x5D (64 – 93)	**Common Data Pages** The common data pages have their formats defined. Use of these pages is defined by the transmission type of the ANT channel parameter. All unused pages in this section are undefined and are not to be used.
0x5E – 0x6F (94 – 111)	**Reserved for future use** Do not use these page values.
0x70 – 0x7F (112 – 127)	**Manufacturer Specific for Toggle Bit Device Profiles** Pages in this range can be used by the manufacturer as they desire in profiles that use a toggle bit. This range of pages does not insist on interoperability for toggle bit profiles and will allow device manufacturers to transmit unpublished data formats in this range. This page range is reserved for profiles that do not use a toggle bit.
0x80 – 0xDF (128 – 223)	**Reserved for future use** Do not use these page values.
0xE0 – 0xFF (224 – 255)	**Manufacturer Specific** Pages in this range can be used by the manufacturer as they desire. This range of pages does not insist on interoperability and will allow device manufacturers to transmit unpublished data formats in this range.

The first 64 page numbers have been reserved for the ANT+ Alliance managed networks. The next 30 data pages are reserved for common page definitions that may be used within any ANT network; Another 140 pages have been reserved for future use. Finally, 32 pages are available for the transmission of manufacturer specific data (16 for toggle bit device profiles), allowing proprietary data to be sent on these defined pages.

5 ANT Page Formats

The first byte for all data pages contains the data page number (Table 5-1). The data contained in the remaining 7 bytes is defined in the relevant ANT+ device profile, or as described in this document.

Table 5-1. Generic Data Page Format

Byte	Description	Length
0	Data Page Number	1 Byte
1-7	Data	7 Bytes

5.1 Common Data Page Format

Common data pages used by ANT devices are formatted according to Table 5-2 below. The first byte of all common data pages contains the page number. The page numbers reserved for the common data pages ranges from 0x40 – 0x5D.

Table 5-2. Generic Common Data Format

Byte	Description	Length	Value	Units	Rollover
0	Data Page Number	1 Byte	Range 0x40 – 0x5D	N/A	N/A
1 – 7	Data	7 Bytes	These fields will contain the data to be interpreted by the receiver	As per data page description	As per data page description

Bytes 1 – 7 will be formatted with data according to the specific data page that is being sent. Each data page contains different data. The receiver shall implement the appropriate common page definitions in order to decode all incoming data. Data received with an unrecognized data page number shall not be interpreted.

6 Common Data Pages

The following sections describe the defined common data pages relevant to ANT+ devices.

6.1 ANT-FS Common Pages

ANT File Share (ANT-FS) provides a mechanism for authenticated, wireless file transfers between devices. There are two common data pages associated with the ANT-FS protocol: Beacon and the Command/Response data pages. For information and details on ANT-FS refer to the ANT File Share (ANT-FS) Technical Specification and ANT-FS Reference Design User Manual. These pages shall only be used within a complete implementation of the ANT-FS specification.

Please Note: ANT-FS makes use of burst messaging and is intended for point to point file transfer. As such, there are no reserved bytes and these pages will not work on shared channels.

6.1.1 Common Page 67: ANT-FS Client Beacon

The ANT-FS client beacon is used by an ANT-FS client device to inform an ANT-FS host device of the available authentication modes supported, as well as the client device's current state. Any client response from a host command is appended to the beacon as a burst message.

Table 6-1. ANT-FS Client Beacon Description

Byte	Field	Length	Description
0	ANT-FS Beacon ID (0x43)	1 Byte	This ID is used to identify how to interpret the command below
1	Status Byte 1	1 Byte	This is a bit field indicating client device state information
2	Status Byte 2	1 Byte	This is a bit field indicating client device state information
3	Authentication Type	1 Byte	The authentication type supported by this device
4-7	ANT-FS Device Descriptor /Host serial Number	4 Bytes	This field is used to identify a particular manufacturer and device for the purposes of message decoding/encoding. When in Authentication mode, this field is filled in with the host's serial number

6.1.1.1 Status Byte 1

The status byte 1 field indicates if the client device has data for download, if data is able to be uploaded, whether pairing is enabled, and indicates the current operating channel period (i.e. the beacon rate).

Refer to the ANT File Share (ANT-FS) Technical Specification document for details.

6.1.1.2 Status Byte 2

The status byte 2 field indicates the client's current ANT-FS state. This field is used by the host device to verify that requested state transitions have occurred.

Refer to the ANT File Share (ANT-FS) Technical Specification document for details.

6.1.1.3 Authentication Type

The authentication type indicates the type of authentication that is required to establish an ANT-FS session.

Refer to the ANT File Share (ANT-FS) Technical Specification document for details and more information on pairing.

6.1.1.4 ANT-FS Device Descriptor / Host Serial Number

The ANT-FS descriptor field broadcasts device information. In the LINK state, this field contains a device descriptor which indicates the types of communication, and data that this device will support. While in the Authentication or Transport layer, this field broadcasts the serial number of the host device that it is connected to.

Refer to the ANT File Share (ANT-FS) Technical Specification document for details and more information on pairing.

6.1.2 Common Page 68: ANT-FS Host Command/Response

The ANT-FS Host Command/Response is used to request an action and/or information from an ANT-FS client device, or to respond to a command from a client device. The host command/response may require additional information which is appended to the host/command page as a burst message.

Table 6-2. ANT-FS Host Command/Response Description

Byte #	Field	Length	Description
0	ANT-FS Command/Response ID (0x44)	1 Byte	This ID identifies the message as an ANT-FS Command/Response Message
1	Command	1 Byte	The ID of the Command/Response byte
2-7	Parameters	6 Bytes	The parameters depend on the Command/Response sent

A list of commands and responses used by the ANT-FS Protocol are shown below. Note that some commands are only available during certain states of the ANT-FS protocol.

- Commands: Link, Disconnect, Authenticate, Ping, Download, Upload and Erase Requests
- Responses: Authenticate, Download, Upload and Erase Requests

Refer to the ANT File Share (ANT-FS) Technical Specification document for details.

6.2 Common Page 70: Request Data Page

The request data page allows a device to request a specific data page from another device. The request is typically initiated from the display (slave device) to the sensor (master device), and allows the display to request a missed data page, or required data.

The request page is sent as an acknowledged message from a slave device, or as a broadcast message from a master device.

Not all masters will support the ability to respond to a Request Data Page. In this case, the master will not respond at all and will continue to send data according to its device profile. For this reason, data page 70 must be sent from a slave as an acknowledged message. This will allow the requesting slave device to determine if the master received the request, even if the master is unable to respond with the appropriate page. Any slave device that plans to use this data page should be able to handle this "No Response" case elegantly (i.e. without negative effects).

If a device receives a data page request for a page it supports, it should immediately send the requested page the requested number of times, interrupting the regular transmission pattern.

When data page 70 is sent from a master, it is recommended that it be sent as a broadcast message. To ensure that the slave has received data page 70, the master should retry sending data page 70 if it does not receive the requested page from the slave.

Table 6-3. Common Data Page 70 - Request Data Page

Byte	Description	Length	Value	Units
0	Data Page Number	1 Byte	70 (0x46) – Data Page Request	N/A
1-2	Slave Serial Number	2 Bytes	Serial number of slave that page is being requested from. Set to invalid (0xFF) for command types other than 0x03.	N/A
3	Descriptor Byte 1	1 Byte	Allows data specification within the requested data page. Valid Values: 0 – 254 Invalid: 255 (0xFF)	N/A
4	Descriptor Byte 2	1 Byte	Allows data specification within the requested data page. Valid Values: 0 – 254 Invalid: 255 (0xFF)	N/A
5	Requested Transmission Response	1 Byte	Describes transmission characteristics of the data requested. Bit 0-6: Number of times to transmit requested page. Bit 7: Setting the MSB means the device replies using acknowledged messages if possible. Special Values: 0x80 - Transmit until a successful acknowledge is received. 0x00 – Invalid	N/A
6	Requested Page Number	1 Byte	Page number to transmit.	N/A
7	Command Type	1 Byte	Value = 1 (0x01) for Request Data Page Value = 2 (0x02) for Request ANT-FS Session Value = 3 (0x03) for Request Data Page from Slave Value = 4 (0x04) for Request Data Page Set	N/A

6.2.1 Slave Serial Number

This field shall be used if the command type field is set to "0x03: Request Data Page from Slave", and shall be set to the serial number of the slave device intended to respond to the request. In all other cases this field should be set to invalid.

6.2.2 Descriptor Bytes 1 & 2

The descriptor bytes allow for the requesting of data pages that have subfields associated with them, such as the Subfield Data Page. See section 6.13 for examples of using these fields/pages.

When requesting any data page that does not have subfield data these values shall be set to Invalid (0xFF).

6.2.3 Requested Transmission Response

Bits 0 – 6 of this field represent the number of times the requested data page should be transmitted. Setting bit 7 indicates that the requested data page should be sent using Acknowledged data messages. Note that in one-to-many topologies it is not recommended to request acknowledged messages from a master device (and prohibited in most ANT+ device profiles). **Any device that is able to decode a request page must be able to support all requested transmission response types.**

6.2.3.1 Special Values

If byte 5 is set to 128 (0x80), the responding device shall transmit the requested data page using acknowledged messages, and until a successful acknowledgement (i.e. EVENT_TRANSFER_TX_COMPLETED) has occurred.

The value 0x00 has been reserved to indicate this field is invalid.

6.2.4 Command Type

The command type value shall be set to indicate whether the request is sent from a slave to a master (Value = 0x01), from a master to a slave (Value = 0x03), for an ANT-FS session (Value = 0x02), or to request a defined set of pages (Value = 0x04). All other values in this data field are reserved.

If a data page set is requested, and an acknowledged response is requested, the pages are concatenated together as a burst. If broadcast is requested, the pages in the set should be sent one after the other as broadcast messages. Examples of a request data page and request ANT-FS session are show in Figure 6-1 and respectively.

6.2.5 Request Data Page Example

Figure 6-1 shows an example of an established connection between an ANT+ sensor broadcasting data and a display device. The display requires data that is provided in common data page '0xXX'. The display device sends the request for common page 0xXX using common data page 70. The request data page shall specify the request is for a data page (command type = 1), the requested data page number (0xXX), and the number of times the data page shall be transmitted (N). Descriptor bytes will be set to invalid, unless requesting subfield data.

Common Data Page 70 will be sent using an acknowledged message. If the request was not successfully received (i.e. EVENT_TRANSFER_TX_FAILED), the display can decide whether to retry. Once the request has been received, the sensor will transmit the requested data page 'N' times and then return to the standard broadcast rotation (as defined by its ANT+ device profile).

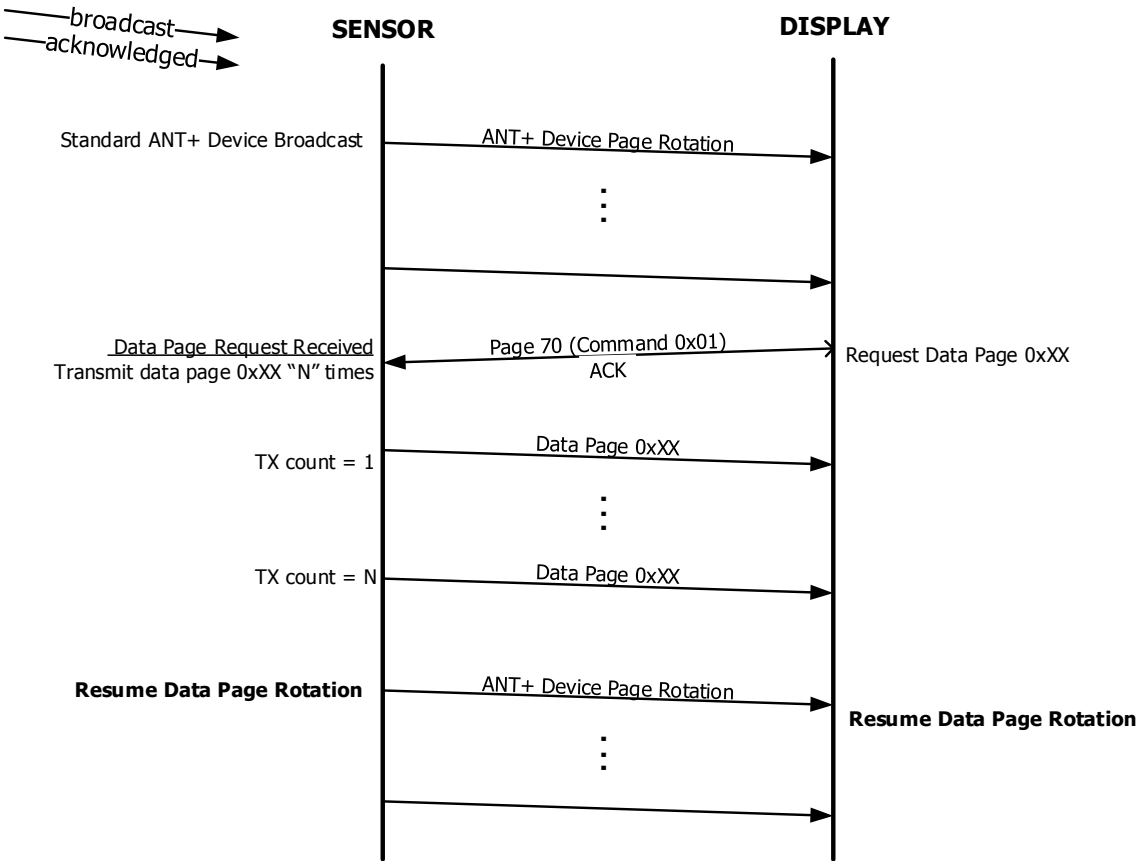


Figure 6-1. Example Request Data Page Command

6.2.6 Requested Broadcast ANT-FS Session Example

Requesting a broadcast ANT-FS session is very similar to requesting a data page, as illustrated in Figure 6-1. The display device sends common data page 70, with the command type set to 2, indicating the request is for an ANT-FS session. The requested data page number shall be set to 0x43, requesting the ANT-FS beacon. The requested transmission response shall be set as desired, indicating the maximum number of ANT-FS beacons that should be transmitted before returning to broadcast mode (i.e. in the case where the link command is not received). Descriptor bytes will be set to invalid.

Common Data Page 70 will be sent using an acknowledged message. If the request was not successfully received (i.e. EVENT_TRANSFER_TX_FAILED), the display can decide whether to retry. Once the request has been received, the sensor will start the ANT-FS session by transmitting the link beacon.

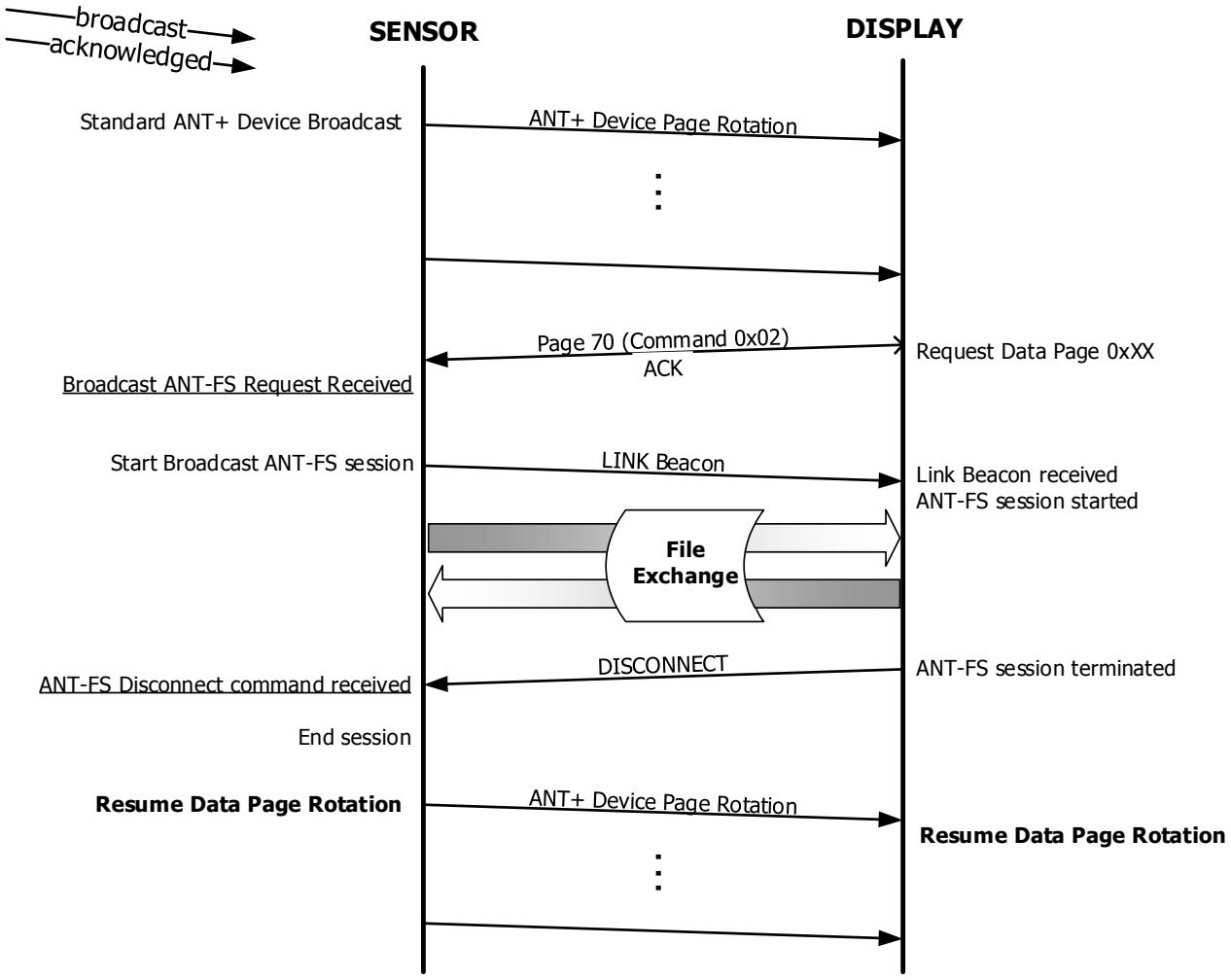


Figure 6-2. Example Request ANT-FS Session

Example: Requesting a Data Page from a Slave

Figure 6-3 shows an example of an established connection between an ANT+ display broadcasting data (master) and a controller device (slave). The display requires data that is provided in common data page "0xXX" from a slave device of serial number "0xYYYY". The display device sends the request for common page 0xXX using common data page 70. The request data page shall specify the request is for a data page from slave "0xYYYY" (command type = 3), the requested data page number (0xXX), and the number of times the data page shall be transmitted (N). Descriptor bytes will be set to invalid, unless requesting subfield data.

Common Data Page 70 will be sent using a broadcast message. Since there is no acknowledgement for a broadcast message, it is recommended to transmit the request data page again in case the requested page is not received. Once the request has been transmitted, the master display device will return to the standard broadcast rotation (as defined by its ANT+ device profile). Once the request has been received, the sensor will transmit the requested data page "N" times.

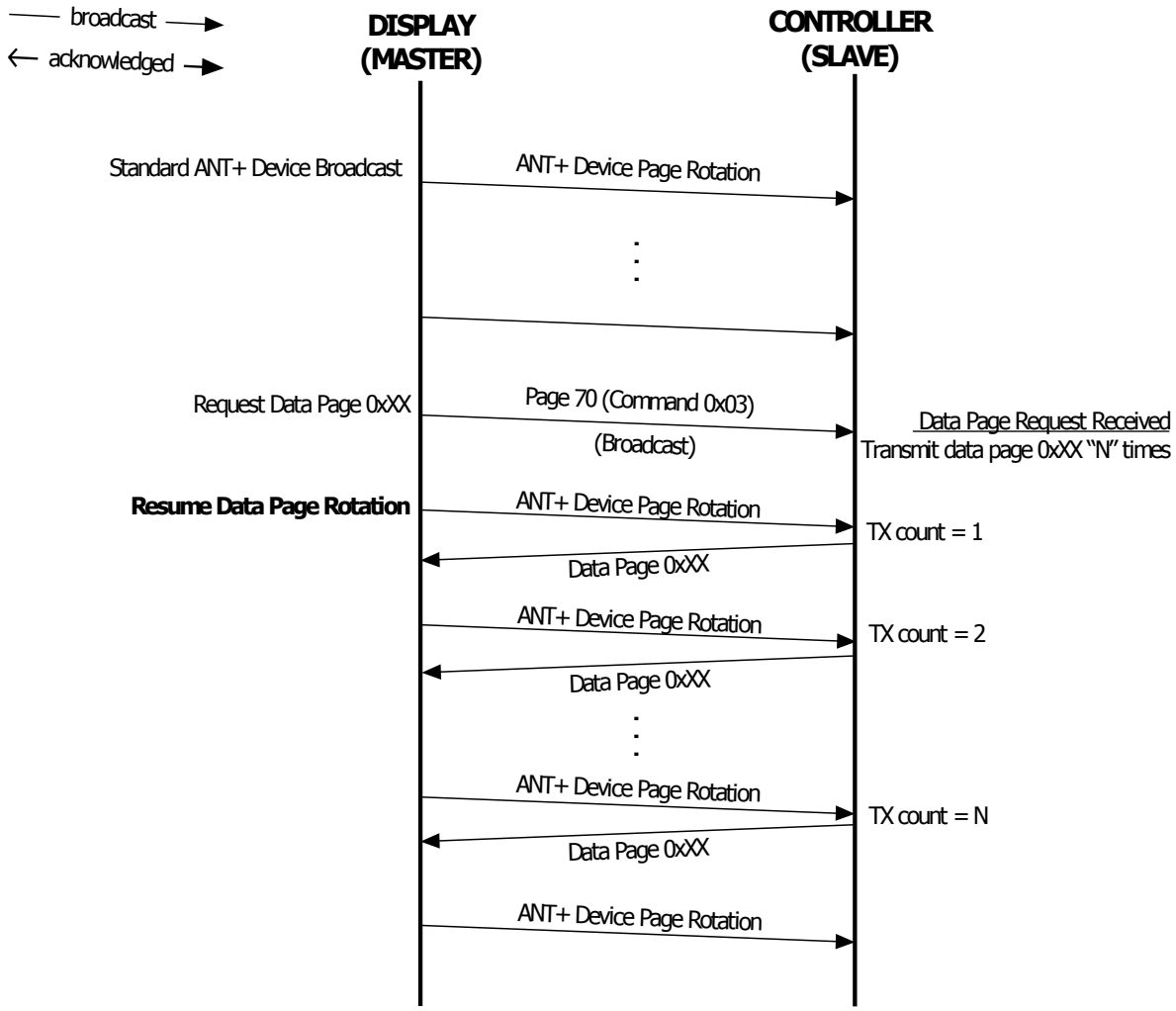


Figure 6-3. Example: Request Data Page Command (Master to Slave)

6.3 Common Page 71: Command Status

The purpose of the Command Status page is to confirm the status of commands sent from a slave to master device. This page is sent in the forward direction only, from master to slave. A slave device may send a command using an application specific reverse channel broadcast message.

The Command Status page is especially useful in cases where the slave sends a command that does not generate an explicit broadcast response. For example, a display (i.e. slave) may send a command to a sensor (i.e. master) to mark a lap event in memory. In most cases, this command would not generate a change/response in the broadcast data. To confirm that the command was successful, the slave may use the Request Data Page (page 70) to request the Command Status page (page 71) from the master.

Table 6-4. Common Data Page 71 – Command Status Data Page

Byte	Description	Length	Value	Units
0	Data Page Number	1 Byte	Page 71 (0x47) – Command Status	N/A
1	Last Received Command ID	1 Byte	Indicates last command ID received. 0 – 254 255 is used to indicate that no command has yet been received	N/A
2	Sequence #	1 Byte	0-254: Sequence number used by Slave in last received command request. 255 is used to indicate that no command has yet been received	N/A
3	Command Status	1 Byte	0 = Pass: command received and processed successfully 1 = Fail: command received and processed unsuccessfully 2 = Not Supported 3 = Rejected – e.g. due to invalid/unregistered slave 4 = Pending: command received and not yet processed 5-254 = Reserved – Do not send or interpret 255 = Uninitialized (Never received a command)	N/A
4-7	Data	4 Bytes	Response data specific to received command ID	N/A

6.3.1 Last Received Command ID

This field is used to indicate the command ID of the last command received by the master from any slave. This value shall be the data page number of an application specific reverse channel broadcast message

The command ID shall NOT be set to the value of a request message data page, such as page 70. If no command has been received, this value shall be set to 255.

6.3.2 Sequence #

The sequence number is used to identify a specific instance of a command. The master should respond to a broadcast message from the slave with the same sequence number as the broadcast message. In the case where no valid sequence number is sent from the slave to the master, this value shall be incremented by the master for each command received.

At reset or battery insertion, the value shall be set to 255 to indicate that no command has yet been received.

6.3.3 Command Status

This byte indicates the status of the previously received command. At reset or battery insertion, the value shall be set to 255 to indicate that no command has yet been received.

6.3.4 Response Data

4 Bytes are allocated for response data that may be specific to the previous command.

6.4 Common Page 73: Generic Command Page

The generic command page allows a device to send commands that can be received by a wide selection of controllable devices. These commands can be specific to a particular ANT+ profile, or be manufacturer specific. The commands are generic and can be used in many use cases, allowing interoperability of common functions between devices from different manufacturers.

The generic command page identifies the slave requesting the command. In applications where authentication is required between a slave and master, this will allow a master to reject the command if needed, based on the identity of the slave.

Table 6-5. Page 73 Format – Generic Command Data Page

Byte	Description	Length	Description	Rollover or Range
0	Page number	1 Byte	73 (0x49) – Command Page	N/A
1	Slave Serial Number LSB	2 Bytes	The serial number of the remote control device. Unknown: 65535 (0xFFFF)	N/A
2	Slave Serial Number MSB			
3	Slave Manufacturer ID LSB	2 Bytes	Refer to FIT SDK for a current list of all manufacturer IDs. Note: for commands originating from a hub device, this is the hub manufacturer ID.	N/A
4	Slave Manufacturer ID MSB			
5	Sequence #	1 Byte	Increment for each new command. Note that sequence numbers for all command pages are taken from the same series. Refer to section 6.4.1.1.	256
6	Command Number LSB	2 Bytes	See Table 6-6. Command Value Mapping	N/A
7	Command Number MSB			

6.4.1 Slave Identification

Bytes 1-4 provide information that identifies the slave device. As the Slave ID does not include a way to identify the specific model of a device, the following condition applies to the custom commands that may be sent using this page:

- Manufacturers choosing to use custom commands, must maintain a consistent implementation across all their ANT+ devices i.e. different model numbers shall not have different commands associated with a given Custom Command Number.

6.4.1.1 Slave Serial Number

The slave serial number field contains two bytes used to help uniquely identify the product (i.e. the lest 2 significant bytes of the ESN). This value is manufacturer specific and not controlled by ANT+.

6.4.1.2 Slave Manufacturer ID

The current list of manufacturer ID values can be found in the FIT.xls profile (available within the FIT SDK at www.thisisant.com). New manufacturers are required to be members of the ANT+ Alliance in order to be added to this list; please contact the ANT+ Alliance at antalliance@thisisant.com for details. The value 255 (0x00FF) has been reserved as a development ID and may be used by manufacturers that have not yet been assigned a value.

6.4.1.1 Sequence

The sequence number allows a receiving device to distinguish between repeat commands and new commands sent by a device; each time that a new command is sent, the sequence number shall be incremented. Note that this is a rollover field, and that: **The sequence numbers for all command pages shall be taken from the same number series.** For example, if an audio command is sent with sequence number 0 and is followed by a generic command, then a character command, and then another audio command, these commands shall be sent with sequence numbers 1, 2, and 3 respectively.

If the message sent by a device is not successful, it is up to the application layer to retry the message. It is possible that the message is successfully received by the receiver, but the acknowledgement to the transmitter fails. This could result in the transmitter repeating the command.

A receiver can identify such repeat commands by matching the incoming sequence # and slave serial number. Repeated commands shall be ignored; however, it is recommended that after a short timeout, the receiver shall allow commands that appear to be repeated. This timeout will prevent accidental blocking of new commands after the command sequence number field has rolled over. The duration of the timeout is application specific, but one minute is recommended.

6.4.2 Command Number

The command number field determines which command is being requested by an ANT+ device, and is detailed in Table 6-6. Command Value Mapping.

Table 6-6. Command Value Mapping

Value	Command	Description
0-32787	ANT+ Profile Specific	Commands ad defined by the relevant ANT+ device profile
32768 – 65534	Custom Commands	Custom commands as defined by Manufacturer
65535	No Command*	No command issued*

Please contact us if your use case requires additional commands to be defined. Note that custom commands are intended only for use in cases where interoperability is not required.

The following condition applies to sending custom commands as part of this profile:

Manufacturers choosing to use custom commands, must maintain a consistent implementation across all their ANT+ devices i.e. different model numbers shall not have different commands associated with a given Custom Command Number.

6.5 Common Page 74: Open Channel Command (0x4A)

Data page 74 is transmitted from a device to another device as an acknowledge message to command the second device to open a master ANT+ device profile channel. For example, this command may be sent over an HRM channel to command an HRM sensor to open a SPD channel. Note that not all ANT+ devices support the open channel command, and that ANT+ devices that do support this command may only support specific ANT+ device types.

Table 6-7. Data Page 74 Format – Open Channel Command Format

Byte	Description	Length	Value	Units	Range
0	Data Page Number	1 Byte	74 (0x4A) – Open Channel Command	N/A	N/A
1	Serial Number (LSB)	3 Bytes	Lower 3 bytes of serial number.	N/A	N/A
2	Serial Number				
3	Serial Number (MSB)				
4	Device Type	1 Byte	The device type of the desired ANT+ profile.	N/A	N/A
5	RF Frequency	1 Byte	The RF frequency specified by the relevant ANT+ device profile.	MHz	N/A
6	Channel Period (LSB)	2 Bytes	The channel period specified by the relevant ANT+ device profile.	N/A	N/A
7	Channel Period (MSB)				

6.5.1 Session Leader ID

Recommended to use lower 3 bytes of unique serial number of the display.

6.5.2 Device Type

The device type field specifies which ANT+ device profile channel the receiving device should open. The receiving device should open a channel with the channel parameters specified by that ANT+ device profile. All message transmitted over the opened ANT+ channel should conform to the ANT+ device profile specification.

6.5.3 RF Frequency

This field specifies which RF frequency the channel should be opened on. The device transmitting the open channel command should ensure that the RF frequency transmitted in the command is in accordance to the relevant ANT+ device profile. Devices receiving this message should open a channel on the RF frequency specified in the command regardless of the ANT+ device profile specification for the sake of future compatibility.

6.5.4 Channel Period

This field specifies which channel period the channel should be opened to match. The device transmitting the open channel command should ensure that the channel period transmitted in the command is in accordance to the relevant ANT+ device profile. Devices receiving this message should open a channel on the channel period specified in the command regardless of the ANT+ device profile specification for the sake of future compatibility.

6.5.5 Device Number

All master channels open on a particular device should transmit the same 32-bit device number: upper nibble of the transmission type (MSN extended device number), and serial number (as transmitted in the Manufacturer Identification page).

6.6 Common Page 76: Mode Settings Page

The purpose of the mode settings page is to allow a device to put another device into a particular sport mode. The expected behaviour of a device in a particular sport mode is profile or manufacturer specific. A device may transmit additional sport metrics, or use optimized algorithms while in a sport mode.

Table 6-8. Common Data Page 76

Byte	Description	Length	Value	Units
0	Data Page Number	1 Byte	76 (0x4C) – Mode Settings Page	N/A
1	Reserved	1 Byte	Reserved: Set to 0xFF	N/A
2	Reserved	1 Byte	Reserved: Set to 0xFF	N/A
3	Reserved	1 Byte	Reserved: Set to 0xFF	N/A
4	Reserved	1 Byte	Reserved: Set to 0xFF	N/A
5	Reserved	1 Byte	Reserved: Set to 0xFF	N/A
6	Reserved	1 Byte	Reserved: Set to 0xFF	N/A
7	Sport Mode	1 Byte	0x01: Running 0x02: Cycling 0x05: Swimming Refer to FIT SDK for 'Sport' enum	N/A

6.6.1 Sport Mode

Sports modes allow a product to be conscious of the activity currently being performed by the user. This knowledge gives a device additional decision making power and allows the device to tailor the information that transmitted, displayed, and sensed based on the activity.

The sport mode field maps to the FIT SDK's 'Sport' enum. Currently, the only valid values are Running, Cycling, and Swimming.

6.7 Common Page 78: Multi-component System Manufacturer's Information (0x4E)

This common data page allows for a manufacturer to transmit a hardware revision, manufacturer ID and a model number.

Table 6-9. Common Page 78 Format – Multi-component System Manufacturer's Information

Byte	Description	Length	Value	Units
0	Data Page Number	1 Byte	78 (0x4E) – Multi-component System Manufacturer's Information	N/A
1	Reserved	1 Byte	Value = 0xFF	N/A
2	Component Identifier	1 Byte	Identifies the component in the system to which this Manufacturer's Information pertains and specifies how many separate components are available in the system. Bits 0 – 3: Number of Components Bits 4 – 7: Component Identifier (Refer to the relevant ANT+ device profile) Set to 0xFF if not used.	N/A
3	HW Revision	1 Byte	To be set by the manufacturer.	N/A
4	Manufacturer ID LSB	2 Bytes	Refer to the FIT SDK for a current list of manufacturer IDs	N/A
5	Manufacturer ID MSB			
6	Model Number LSB	2 Bytes	To be set by the manufacturer.	N/A
7	Model Number MSB			

6.7.1 Component Identifier

The component identifier is used by systems that are made up of components and report manufacturer's information for components separately. The upper nibble of this field is used identify the component in the system to which this message pertains while the lower nibble is used to indicate the total number of components in the system.

Identifier: Identifies component in system to which this message pertains. Refer to the relevant ANT+ device profile.
Number of components: Total number of components in the system reporting manufacturer's information.

When reporting the manufacturer's information for a system with multiple components, it is recommended the device alternate and cycle through the Manufacturer's Information data page for each individual component before repeating. When multiple components are in the system, the transmission frequency of this data page may be increased as long as the minimum transmission pattern requirements as specified by the profile are still met. The display may request the Manufacturer's Information data page for a specific component using the Request data page, specifying the requested component identifier value in the Descriptor Byte 1 field. If this field is not used its value should be set to 0xFF.

6.7.2 Manufacturer ID

The current list of manufacturer ID values can be found in the FIT.xls profile (available within the FIT SDK at www.thisisant.com). The ID corresponding to the manufacturer shall be transmitted. New manufacturers are required to be members of the ANT+ Alliance in order to be added to this list; please contact the ANT+ Alliance at antalliance@thisisant.com for details. The value 255 (0x00FF) has been reserved as a development ID and may be used by manufacturers that have not yet been assigned a value.

6.8 Common Page 79: Multi-component System Product Information (0x4F)

Common data page 0x4F is similar to the multi-component manufacturer's information page (0x4E). This page allots two bytes for software revision number as well as the ability to transmit the lowest four bytes of the device's serial number.

Table 6-10. Common Page 79 Format – Multi-component System Product Information

Byte	Description	Length	Value	Units
0	Data Page Number	1 Byte	79 (0x4F) – Multi-component System Product Information	N/A
1	Component Identifier	1 Byte	Identifies the component in the system to which this Manufacturer's Information pertains and specifies how many separate components are available in the system. Bits 0 – 3: Number of Components Bits 4 – 7: Component Identifier (Refer to the relevant ANT+ device profile) Set to 0xFF if not used.	N/A
2	SW Revision (Supplemental)	1 Byte	Supplemental SW Revision (Invalid = 0xFF)	N/A
3	SW Revision (Main)	1 Byte	Main SW Revision defined by manufacturer OR: SW version defined by manufacturer if byte 2 is set to 0xFF.	N/A
4	Serial Number (Bits 0 – 7)	4 Bytes	The lowest 32 bits of the serial number. Value 0xFFFFFFFF to be used for devices without serial numbers	N/A
5	Serial Number (Bits 8 – 15)			
6	Serial Number (Bits 16 – 23)			
7	Serial Number (Bits 24 – 31)			

6.8.1 Component Identifier

The component identifier is used by systems that are made up of components and report product information for components separately. The upper nibble of this field is used identify the component in the system to which this message pertains while the lower nibble is used to indicate the total number of components in the system.

Identifier: Identifies component in system to which this message pertains. Refer to the relevant ANT+ device profile.
Number of components: Total number of components in the system reporting manufacturer's information.

When reporting the product information for a system with multiple components, it is recommended the device alternate and cycle through the Product Information data page for each individual component before repeating. When multiple components are in the system, the transmission frequency of this data page may be increased as long as the minimum transmission pattern requirements as specified by the profile are still met. The display may request the Product Information data page for a specific component using the Request data page, specifying the requested component identifier value in the Descriptor Byte 1 field. If this field is not used its value should be set to 0xFF.

6.8.2 SW Revision

The SW revision is managed by the manufacturer and specifies the version of the software running on the transmitting device. If bytes 2 and 3 are both valid, then these fields shall be interpreted as the SW Revision number as described in Equation 6-3.

$$SW\ Revision = \frac{Main\ SW\ Revision\ \times 100 + Supplimental\ SW\ Revision}{1000}$$

Equation 6-1. Decoding Supplemental SW Revision

For example, if a manufacturer uses a SW Revision format:

SW Revision = 1.380 where '1.3' is the Main SW Revision and '80' is the Supplemental SW Revision.

This would be encoded as follows:

Main SW Revision = 13 (as only integer values may be sent in this field)

Supplemental SW Revision = 80

If only the Main SW Revision field is used, then its value is defined by the manufacturer. In this case the Supplemental SW Revision field shall be set to 0xFF. If the Supplemental SW Revision number is set to invalid, the SW Revision number can be interpreted as described in Equation 6-4.

$$SW\ Revision = \frac{Main\ SW\ Revision}{10}$$

Equation 6-2. Decoding Main SW Revision

6.9 Common Data Page 80: Manufacturer's Information

This common data page allows for a manufacturer to transmit a hardware revision, manufacturer ID and a model number.

Table 6-11. Common Data Page 80 – Manufacturer's Information

Byte	Description	Length	Value	Units
0	Data Page Number	1 Byte	80 (0x50) – Manufacturer's Information	N/A
1	Reserved	1 Byte	Value = 0xFF	N/A
2	Reserved	1 Byte	Value = 0xFF	
3	HW Revision	1 Byte	To be set by the manufacturer.	N/A
4	Manufacturer ID LSB	2 Bytes	Refer to the FIT SDK for a current list of manufacturer IDs.	N/A
5	Manufacturer ID MSB			
6	Model Number LSB	2 Bytes	To be set by the manufacturer.	N/A
7	Model Number MSB			

6.9.1 Manufacturer ID

The current list of manufacturer ID values can be found in the FIT.xls profile (available within the FIT SDK at www.thisisant.com). New manufacturers are required to be members of the ANT+ Alliance in order to be added to this list; please contact the ANT+ Alliance at antalliance@thisisant.com for details. The value 255 (0x00FF) has been reserved as a development ID and may be used by manufacturers that have not yet been assigned a value.

6.9.2 Example of Manufacturer's Information

The 8-byte packet of manufacturer's information as shown in Figure 6-4 below is interpreted to represent the hardware revision = 10, the manufacturer ID = 2 and the model number = 292.

ANT Message Payload = [50][FF][FF][0A][02][00][24][01]

Figure 6-4. Example of Manufacturer's Information

6.10 Common Data Page 81: Product Information

Common data page 0x51 is similar to the manufacturer's information page (0x50) as this allots two bytes for software revision number as well as the ability to transmit the lowest four bytes of the device's serial number.

Table 6-12. Common Data Page 81 – Product Information

Byte	Description	Length	Value	Units
0	Data Page Number	1 Byte	81 (0x51) – Product Information	N/A
1	Reserved	1 Byte	Value = 0xFF	N/A
2	SW Revision (Supplemental)	1 Byte	Supplemental SW Revision (Invalid = 0xFF)	N/A
3	SW Revision (Main)	1 Byte	Main SW Revision defined by manufacturer OR: SW version defined by manufacturer if byte 2 is set to 0xFF.	N/A
4	Serial Number (Bits 0 – 7)	4 Bytes	The lowest 32 bits of the serial number. Value 0xFFFFFFFF to be used for devices without serial numbers	N/A
5	Serial Number (Bits 8 – 15)			
6	Serial Number (Bits 16 – 23)			
7	Serial Number (Bits 24 – 31)			

6.10.1 SW Revision

The SW revision is managed by the manufacturer and specifies the version of the software running on the transmitting device. If bytes 2 and 3 are both valid, then these fields shall be interpreted as the SW Revision number as described in Equation 6-3.

$$SW\ Revision = \frac{Main\ SW\ Revision\ \times 100 + Supplimental\ SW\ Revision}{1000}$$

Equation 6-3. Decoding Supplemental SW Revision

For example, if a manufacturer uses a SW Revision format:

SW Revision = 1.380 where '1.3' is the Main SW Revision and '80' is the Supplemental SW Revision.

This would be encoded as follows:

Main SW Revision = 13 (as only integer values may be sent in this field)

Supplemental SW Revision = 80

If only the Main SW Revision field is used then its value is defined by the manufacturer. In this case the Supplemental SW Revision field shall be set to 0xFF. If the Supplemental SW Revision number is set to invalid, the SW Revision number can be interpreted as described in Equation 6-4.

$$SW\ Revision = \frac{Main\ SW\ Revision}{10}$$

Equation 6-4. Decoding Main SW Revision

6.10.2 Example of Product Information

The 8-byte packet of product information shown in Figure 6-5 below is interpreted to represent the software revision = 1.380, and the lowest 32 bits of the serial number of the transmitting device = 19136514.

ANT Message Payload = [51][FF][50][0D][02][00][24][01]

Figure 6-5. Example of Product Information

6.11 Common Data Page 82: Battery Status

This page is sent to allow the battery voltage and status of device to be transmitted. Bytes 3 – 5 allow for an hour meter to be defined allowing a device to transmit the amount of time that it has been running on a given battery. This is a required field for this data page.

Devices with advanced circuitry can utilize byte 6 to give the fractional voltage and byte 7 to use the descriptive bit field that gives the coarse battery voltage, the battery status, and the units of the hour meter.

Table 6-13. Common Data Page 82 - Battery Status

Byte	Description	Length	Value	Units	Rollover
0	Data Page Number	1 Byte	82 (0x52) – Battery Status	N/A	N/A
1	Reserved	1 Byte	Value = 0xFF	N/A	N/A
2	Battery Identifier	1 Byte	Identifies the battery in system to which this battery status pertains and specifies how many batteries are available in the system. Bits 0 – 3: Number of Batteries Bits 4 – 7: Identifier Set to 0xFF if not used.	N/A	N/A
3	Cumulative Operating Time (bits 0 – 7)	3 Bytes	This will give the cumulative operating time of the device and should be reset on insertion of a new battery. Range = 0 – 16777215 ticks	2 seconds 16 seconds	1.1 years 8.5 years
4	Cumulative Operating Time (bits 8 – 15)				
5	Cumulative Operating Time (bits 16 - 23)				
6	Fractional Battery Voltage	1 Byte	Value = 0 – 255 (0x00 – 0xFF)	1/256 (V)	N/A
7	Descriptive Bit Field	1 Byte	Battery Status, Cumulative Operating Time Resolution, and Coarse Battery Voltage See Table 6-14 for more details.	Binary	N/A

6.11.1 Battery Identifier

The battery identifier is used by systems that are made up of components and have a need to report battery status information from multiple batteries. The upper nibble of this field is used identify the battery in the system to which this message pertains while the lower nibble is used to indicate the total number of batteries in the system.

Identifier: Identifies battery in system to which this message pertains.
Number of batteries: Total number of batteries in the system needing to report battery status.

Only the battery with the lowest battery level should be broadcast in the regular common page transmission pattern. This ensures that display devices that do not support the device identifier field still show a consistent and meaningful value. The display may request battery information of all other devices individually using the Request Data Page (Common Page 70), and setting descriptor byte 1 to the value of the desired identifier.

For example, a pedal based power meter may report power for both the left and the right pedals by setting the 'Identifier' field to 0 for the right pedal battery and 1 for the left pedal battery while setting the 'Number of batteries' field to 2. If the left pedal battery had the lower voltage its value would be reported in the regular transmission for the Battery Status page. The display may request the battery status of the right pedal to get a better picture of the entire system's battery status.

If this field is not used its value should be set to 0xFF.

6.11.2 Descriptive Bit Field

The coarse battery voltage can be found easily by using the bit mask of 0x0F on byte 7 as it requires no bit shifting.

Table 6-14. Battery Voltage Descriptive Bit Field

Bits	Value	Description
0 – 3	0 – 14 Volts 0xF (15): Invalid	Coarse Battery Voltage Use bit mask of 0x0F
4 – 6	0	Reserved for future use
	1	Battery Status = New
	2	Battery Status = Good
	3	Battery Status = Ok
	4	Battery Status = Low
	5	Battery Status = Critical
	6	Reserved for future use
	7	Invalid
7	0 – 16 second resolution 1 – 2 second resolution	The resolution used for the cumulative operating time

6.11.3 Invalid Battery Voltage

If the battery voltage is unable to be measured and transmitted by the device a value of 15 (0x0F) shall be used in bits 0 – 3 of the descriptive bit field and a value of 255 (0xFF) shall be used in the fractional battery voltage data field.

However a value of 255 (0xFF) does not indicate that the voltage data field is invalid. This can only be determined by the value in the descriptive bit field.

6.11.4 Example of Battery Voltage Page Data

The 8-byte packet of battery voltage is shown in Figure 6-6. Starting at byte 7 with the descriptive bit field = 0x32 = 00110010. The lowest four bits indicate the value of the coarse battery voltage = 0010 = 2 Volts. The next three bits indicate the battery status = 011 = 3, which is interpreted to be 'Ok'.

```
ANT Message Payload = [52][FF][FF][1A][2C][03][8B][32]
```

Figure 6-6. Example of Battery Voltage Data

The highest bit of the descriptive bit field denotes what resolution the hour meter is updating at. With this bit = 0 it is interpreted that the hour meter is using a 16 second resolution. Therefore the cumulative operating time is found to be = 0x32C1A * 16s = 3118470s / 3600s/hr = 923.99 hours.

Byte 6 of this message gives the fractional battery voltage = 0x8B = 139 / 256V = 0.543V. Adding this to the coarse voltage of 2V the battery voltage is determined to be 2.543V.

6.12 Common Data Page 83: Time and Date

The time and date data page allows a time stamp to be sent from a time keeping device. All data fields of this page are required, with the exception of the Day of Week field. Time values used shall reference to UTC time. To use this page all fields must be correctly populated.

Table 6-15. Common Data Page 83 – Time and Date

Byte	Description	Length	Value	Units
0	Page Number	1 Byte	83 (0x53) – Time and Date	N/A
1	Reserved	1 Byte	0xFF	N/A
2	Seconds	1 Byte	The number of seconds. Valid data range = 0 – 59	1 second
3	Minutes	1 Byte	The number of minutes. Valid data range = 0 - 59	1 minute
4	Hours	1 Byte	The current hour of the day in a 24 hour clock. Valid data range = 0 - 23	1 hour
5	Day of Week	3 Bits (bits 7-5 of Byte 6)	Sunday = 0, Monday = 1, …, Saturday = 6 Invalid = 7	1 day
	Day	5 Bits (bits 4-0 of Byte 6)	The day of the month. Valid data range = 1 - 31	1 day
6	Month	1 Byte	The month of the year. Valid data range = 1 - 12	1 month
7	Year	1 Byte	The year since the year 2000. Valid data range = 0 - 255	1 year

6.12.1 Example of Time and Date Page Data

Figure 6-7 shows an example of a common data page that is communicating time and date information. Properly decoding this message payload will yield a time of 17:27:13 on Thursday June 18, 2009 UTC.

ANT Message Payload = [53][FF][0D][1B][11][92][06][09]

Figure 6-7. Example of Time and Date Data

6.13 Common Data Page 84: Subfield Data

The subfield common data page allows for two subfields of data to be sent within a single data message. These data subfields are defined in Table 6-17. This data page allows for a variety of common data elements to be transmitted in a single page.

Table 6-16. Common Data Page 84 - Subfield Data

Byte	Description	Length	Value	Units
0	Page Number	1 Byte	84 (0x54) – Subfield Data	NA
1	Reserved	1 Byte	0xFF	NA
2	Subpage 1	1 Byte	Indicates the page value for bytes 4 & 5 Value range: 1 – 254 Invalid = 255 (0xFF)	NA
3	Subpage 2	1 Byte	Indicates the page value for bytes 6 & 7 Value range: 1 – 254 Invalid = 255 (0xFF)	NA
4	Data Field 1 LSB	2 Bytes	As per description in Table 6-17.	
5	Data Field 1 MSB			
6	Data Field 2 LSB	2 Bytes	As per description in Table 6-17.	
7	Data Field 2 MSB			

Table 6-17. Valid Subpages for Common Page 84

Sub Page Number	Description	Length	Value	Units	Valid Range
1	Temperature LSB Temperature MSB	2 Bytes	A signed value using two's complement system measuring temperature in ºC.	0.01 ºC	-326.67 - +326.67
2	Barometric Pressure LSB Barometric Pressure MSB	2 Bytes	Pressure ranging from 0kPa to 655.35kPa.	0.01 kPa	0 - 655.35
3	Humidity LSB Humidity MSB	2 Bytes	Percent humidity of the air.	0.01%	Max Value = 100%
4	Wind Speed LSB Wind Speed MSB	2 Bytes	The speed of the wind measured in km/hr.	0.01km/h	Max Value = 655.35km/h
5	Wind Direction LSB Wind Direction LSB	2 Bytes	The direction of the wind in degrees.	0.05º	Max Value = 7199 (359.95º)
6	Charging Cycles LSB Charging Cycles MSB	2 Bytes	The number of times the device has been fully charged.	Cycles	0-65535
7	Minimum Operating Temperature LSB Minimum Operating Temperature MSB	2 Bytes	A signed value using two's complement of the maximum recorded temperature in °C.	0.01 °C	-326.67 - +326.67
8	Maximum Operating Temperature LSB	2 Bytes		0.01 °C	-326.67 - +326.67

	Maximum Operating Temperature MSB		A signed value using two's complement of the minimum recorded temperature in °C.		
9-254	Reserved for future use				

6.13.1 Example of a Subfield Data Message

Figure **6**-**8** shows an example of the data transmitted using the subfield data page. The first subfield of this data page communicates temperature and the value given in this message is 26.67° C. The second subfield of this data page communicates percent humidity. The value of the humidity field is 66.34%.

ANT Message Payload = [54][FF][01][03][6B][0A][EA][19]

Figure 6-8**. Subfield Data Message**

6.14 Common Page 85: Memory Level

The memory level common data page is used by devices with data storage capacity to communicate the remaining available memory on the device. All fields are required.

Table 6-18. Common Data Page 85 – Memory Level

Byte	Description	Length	Value	Units
0	Data Page Number	1 Byte	0x55 – Common Page 85	N/A
1	Reserved	1 Byte	Value = 0xFF	N/A
2	Reserved	1 Byte	Value = 0xFF	N/A
3	Reserved	1 Byte	Value = 0xFF	N/A
4	% Used	1 Byte	0 – 100 % in 0.5% increments	0.5 %
5	Total Size LSB	1 Byte	Total Memory Size in 0.1 increments Max 6553.5	N/A
6	Total Size MSB			
7	Total Size Unit	1 Byte	Bit 7: 0 – bit 1 – byte Bit 0 - 6: 000000 – base unit 000001 – kilo 000010 – Mega 000011 – Tera 000100 to 000101 - reserved	N/A

6.15 Common Page 86: Paired Devices

The paired devices common data page allows a device to describe other ANT devices it is paired to, and communicate the status of those devices.

Table 6-19. Common Data Page 86 – Paired Devices

Byte	Description	Length	Value	Units
0	Data Page Number	1 Byte	0x56 – Common Page 86	N/A
1	Peripheral Device Index	1 Byte	If multiple peripheral devices are in the system, this field provides an index to which device is being referenced.	N/A
2	Total Number of connected devices	1 Byte	Provides the total number of peripheral devices in a system.	
3	Channel State	1 Byte	Bit 7: Paired/Unpaired 1 – paired 0 – not paired Bits 3:6: Connection State 0 – closed channel 1 – searching 2 – synchronised 3:F – reserved Bits 0:2: Network Key 0 – public 1 – private 2 – ANT+ Managed 3 – ANT-FS key 4:7 – reserved	N/A
4	Peripheral Device ID: Device Number LSB	2 Bytes	Provides the Device Number of the peripheral device indexed in byte 1	N/A
5	Peripheral Device ID: Device Number MSB			
6	Peripheral Device ID: Transmission Type	1 Byte	Provides the Transmission Type of the peripheral device indexed in byte 1	N/A
7	Peripheral Device ID: Device Type	1 Byte	Provides the Device Type of the peripheral device indexed in byte 1	N/A

6.15.1 Peripheral Device Index

If more than one peripheral device is included in the system, the collector device can index each device using this number. For example, a remote listening to both an HRM and GPS device may index HRM to the value 0 and the GPS to value 1.

6.15.2 Channel State

Indicates if there is a paired device or not, and if so, what state the channel is currently in.

6.15.3 Peripheral Device ID

Bytes 4 through 7 provide the channel ID of the paired/not paired peripheral device indexed in byte 1. If there is an unpaired peripheral device in the system, wildcards will feature in the channel ID.

An invalid value of 0xFF may be used for proprietary/custom peripheral devices.

6.16

6.16 Common Page 87: Error Description

The error common page allows a device to indicate it is in an error state.

Table 6-20. Common Data Page 87 – Error Description

Byte	Description	Length	Value	Units
0	Data Page Number	1 Byte	Data Page Number = 87 (0x57)	N/A
1	Reserved	1 Byte	Reserved: Set to 0xFF	N/A
2	System Component Index	4 Bits (0:3)	System Component Identifier (defined by manufacturer) 0xF: Invalid, System Error	N/A
	Reserved	2 Bits (4:5)	Reserved. Set to 0b00.	N/A
	Error Level	2 Bits (6:7)	0: Reserved 1-2: Refer to Table 6-21. 3: Reserved	N/A
3	Profile Specific Error Codes	1 Byte	The purpose of the profile specific error codes is to define error codes required for interoperability across different manufacturers. Refer to the relevant ANT+ device profile for definition. 0xFF: Invalid	N/A
4-7	Manufacturer Specific Error Codes	4 Bytes	Defined by the manufacturer. 0xFFFFFFFF: Invalid	N/A

6.16.1 System Component Index

The system component index field allows the device to indicate which component is responsible for causing the error associated with this data page. The values for this field are defined by the manufacturer.

The system component index field shall be set to 0xF if the error is not restricted to a specific component.

6.16.2 Error Level

Table 6-21. Error Level Definitions

Value	Definition	Description
1	Warning	Device will recover automatically from the error state.
2	Critical	Device will not automatically recover from the error state. User action may be required.

6.16.3 Manufacturer Specific Error Code

It is recommended that this error code is recorded or displayed to the user by the display device for the purposes of troubleshooting and product support.

The manufacturer specific error code and profile specific error code fields may both be populated with valid values in the error description data page. The manufacturer may use this field to provide further information when a profile specific error occurs.

6.17 Common Pages 64-66, 69, 72, 75, 77, and 88-93: Reserved for Future Use