



PRESENTATION DEVICES
INTERFACE CONTROL DOCUMENT
ICD.FASIT.PD
RELEASE 1.1

25 MAY 2007



Approved for public release; distribution is unlimited.

Release 1.1
25 May 2007

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List of Revisions

Revision Log		
Revision/Version No.	Description	Date
Release 1.0	<p>Initial Release</p> <p>This is the initial release of this ICD since NGATS responsibility was moved within PEO STRI from PM ITTS to PM TRADE. It is part of the new set of FASIT ICDs based on the concept of a Common Interface Component. The set now includes the System ICD, containing information common to all device types, and a series of ICDs with the messages and fault codes unique to each device type. This is one of that series.</p> <p>Changes made due to the transition of responsibility include:</p> <p>Changed project name from New Generation Army Targetry Systems (NGATS) to Future Army System of Integrated Targets (FASIT) per ATSC direction and updated all tables and diagrams accordingly.</p> <p>Removed “For Official Use Only” designation. Received approval for public release with unlimited distribution.</p> <p>Changed TMO to PM TRADE as the responsible lead agency for the document.</p> <p>Changes from the previous NGATS ICD include:</p> <p>Incorporated comments from the October 2005 Targetry WG meeting.</p> <p>Incorporated comments from industry.</p> <p>Changed Target Processor to Target Controller</p>	12/1/06

Revision Log		
Revision/Version No.	Description	Date
	<p>Removed time stamp from all message headers.</p> <p>Added “Reserved for Future Use” field to header (to fill space formerly occupied by the timestamp).</p> <p>Added text to indicate command IDs corresponding to unsupported capabilities should generate a “Can’t Comply.”</p> <p>Deleted power and communication interface and cabling requirements which are common to all devices. This information is now in the System ICD referenced in Section 1.0.</p> <p>Added default values for the Exposure Record and Sensor Record fields in Message 2100 – Event Command (Table I). Deleted the MILES Record field from this message.</p> <p>In Message 2101 – Event Command Acknowledge (Table II), deleted the Position Record, Hit Sensor Status, and MILES Status fields.</p> <p>Added a new Message 2111, Device ID and Capabilities, to respond to the common Device Definition Request (Message 100).</p> <p>In Message 2102 – Presentation Device Status (Table IV) changed “Battery Status” to “Power Status” to indicate if the PD is operating from installation (shore) power or from an alternative power source such as a battery.</p> <p>Changed the MILES Ammo Type from “byte” to “unsigned char” to be consistent in the designation. This is in the MILES Record (Table XIX) which is part of Message 2114 – Configure MILES Shootback Command (Table V) and Message 2115 – MILES Shootback Status (Table VI).</p> <p>Added new messages for Muzzle Flash and GPS location for PDs supporting these features, as follows:</p> <ul style="list-style-type: none"> Message 2110 – Configure Muzzle Flash Command Message 2112 - Muzzle Flash Simulation Status Message 2113 – GPS Location 	

Revision Log		
Revision/Version No.	Description	Date
	<p>Added Section 2.3 and Table X to clarify the expected responses to the Event Command message for each Command ID.</p> <p>In Table XI, Command ID, added Command IDs 5 through 7.</p> <p>In Table XIII, Sensor Record, corrected the comment defining Hit Count, which had previously been a duplicate of the Hits to Kill description. Added clarification to the comments for the Reaction and Sensitivity fields.</p> <p>In Table XIV, Response ID, clarified the requirement for the Response Message Number and Response Sequence ID to be zero for unsolicited messages.</p> <p>In Table XVII, Position Record, clarified the comment for the Exposure of the target to provide for a value of 45 while the PD is transitioning between concealed and exposed positions.</p> <p>In Table XVIII, Hit Sensor Status, expanded the comment for Sensitivity to state the least sensitive and most sensitive values.</p> <p>In Table XIX, MILES Record, updated the Basic MILES Code enumeration to the current MILES Communication Code (MCC) Standard, PMT 90-S002J, dated 19 January 2005. Added the statement that the MCC takes precedence over this document.</p> <p>Added Table XXI, GPS Location Record in support of Message 2113 – GPS Location Request (Table IX).</p> <p>In Table XXII, PD Fault Codes, added Error Code 11 back to the table with a value of Unassigned.</p> <p>Added Table XXIII, Target Reaction When Killed, to clarify expected PD reaction.</p>	

Revision Log		
Revision/Version No.	Description	Date
Release 1.1	<p>In Section 2.5, replaced the previous Messaging diagrams with more detailed, use specific diagrams.</p> <p>Added a note to Section 2.3, under Table X to clarify expected behaviors for moving targets upon issuance of a Reset Device Command.</p> <p>Added a note to Section 2.2.2, under Table II to clarify expected behaviors if Event Commands include data fields not supported by the Presentation Device.</p> <p>Added a note to Section 2.2.4, under Table IV to clarify expected behavior if Hit Count is equal to Hits to Kill and an Expose Command is issued.</p> <p>Added a note to Section 2.2.1, under Table I to clarify expected behavior and utilization of the default values for the Sensor Record data fields.</p> <p>Modified Table XX to reflect that the Initial Delay and Repeat Delay data fields as “Unsigned short” vice “Unsigned char”; added the range values of 0 to 60 to each of these Delay data fields.</p>	5/25/07

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1.0 Scope

The Presentation Devices Interface Control Document (ICD) describes the component interfaces required for two-way communication between the Future Army System of Integrated Targets (FASIT) Target Presentation Devices and the FASIT Target Controller. This ICD is one of a set of documents that specifies the FASIT component interfaces required to support the FASIT system architecture. The physical and electrical characteristics of the interfaces as well as data types and requirements common to all device types are contained in the System Devices ICD, ICD.FASIT.SYS. In this document, Device means a FASIT compliant Target Presentation Device.

1.1 Document Overview

This document is divided into two sections. Section 1.0 provides the scope of the document and a short overview of the document content. Section 2.0 discusses the specific power interfaces, communication message structures, and OEM fault codes used between the Target Controller and the Presentation Device. This document is intended to supplement the System Devices ICD referenced above.

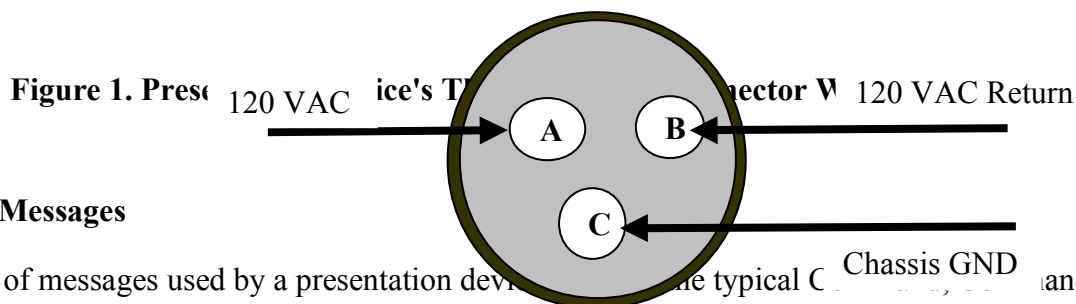
2.0 Interface Description

2.1 Power Requirements

Primary and secondary power interfaces and cabling requirements are contained in the FASIT System Devices ICD. The section below defines the additional requirement unique to the Presentation Device.

2.2 Thermal Device Power Characteristics

Power for the Target Direct Heating Representation Device will be supplied through the Presentation Device. The Presentation Device will provide a MS3470W12-3S, or equivalent, connector that will supply 120 Volts Alternating Current (VAC) wired in accordance with Figure 1 below.



2.3 Messages

The set of messages used by a presentation device include the typical Configuration, Acknowledgement, Device ID and Capabilities, and Device Status messages, as well as PD-unique messages. These consist of Configure MILES Shootback, MILES Shootback Status, Configure Muzzle Flash, Muzzle Flash Simulation Status, and GPS Location messages. Each of these is documented below and the set is followed by the descriptions of the message fields. The Message Header and Common BIT Request (Message 100) are described in the System Devices ICD, ICD.FASIT.SYS.

In the event of communication link failure, the Presentation Device is responsible for reconnecting to the Target Controller and taking immediate precautionary measures. These measures include, but are not limited to, concealing the target silhouette if it is exposed, and bringing the PD to a complete stop if it is in motion.

Changes in PD status shall trigger an unsolicited Presentation Device Status message (2102) to be sent by the PD, regardless of the source of the status change (physical switches on the PD, field maintenance utilities, etc.). For exposure, the PD shall send an unsolicited Presentation Device Status message (2102) when it locks into either the exposed or concealed position and when it is transitioning between the exposed and concealed state (Exposure value = 45) in either direction (exposing or concealing). For movement, the PD shall send an unsolicited Presentation Device Status message (2102) when it starts moving, stops moving, and at 10 meter increments when in motion. Commands will have sequence IDs ranging from 1 – ($2^{32} - 1$). Unsolicited messages shall contain a response sequence ID of zero. If a PD detects an error condition such as a target jam, it shall generate an unsolicited Message Number 2102 – Presentation Device Status. The OEM fault field will be used to indicate the error.

2.4 Presentation Device Event Command Message

The PD Event Command message is sent from the Target Controller to instruct the PD to perform an operation based on the Command Identifier (ID). All commands require the PD to return an acknowledgement or status.

Table I. Message Number 2100 - Event Command

Field Size	Message fields	
Bits 0 – 127	Message Header	Message Number – unsigned short
		ICD Version Number – 2 unsigned short
		Sequence ID – unsigned integer
		Reserved for future use. 4 bytes all zeros
		Length of Message (in bytes) – unsigned short (Includes message header and body)
Bits 128 – 135	Command ID (Table XI)	8-bit enumeration
Bits 136 – 215	Exposure Record (Table XII)	Exposure – unsigned char
		Aspect – short integer
		Direction – unsigned short
		Move – 8-bit enumeration
		Speed (MPH) – 32-bit floating point number
		Default value Bits 136 – 215 = 0
Bits 216 – 303	Sensor Record (Table XIII)	ON/OFF – 8-bit enumerated type
		Hit Count – unsigned short
		Reaction – 8-bit enumerated type
		Hits To Kill – unsigned short
		Sensitivity – unsigned short
		Mode – 8-bit enumeration
		Burst Separation – unsigned short
		Default value bits 216 – 303 = 0

Note: In the cases where the Sensor Record data fields are not utilized by the Command ID structure, the Event Command Message should set these values at zero. The default value for the bits is not reflective of Presentation Device behavior and the target controller must set these at the time of the exercise step execution.

2.5 Event Command Acknowledgement Message

This message is sent from the PD to the Target Controller in response to Command IDs (0, 1, 3, 4, 5) inside the Command message to inform the Target Controller that the PD has received a command, and whether or not it can perform the requested command.

Table II. Message Number 2101 - Event Command Acknowledge

Field Size	Message fields

Field Size	Message fields	
Bits 0 – 127	Message Header	Message Number – unsigned short
		ICD Version Number – 2 unsigned short
		Sequence ID – unsigned integer
		Reserved for future use. 4 bytes all zeros
		Length of Message – unsigned short (Includes message header and body)
Bits 128 – 175	Response ID (Table XIV)	Response Message Number - unsigned short
		Response Sequence ID - unsigned integer
Bits 176 – 183	Acknowledge Response (Table XV)	8-bit enumeration

Note: If the Event Command Message is a Command ID (3), Expose Request, and the Exposure Record contains values within the data fields for actions not supported by the Presentation Device, the Presentation Device shall perform those behaviors that are applicable and ignore those behaviors that are not. If the device can perform some or all of the commanded behaviors, the device shall respond with an "S". Only if the device can not perform any of the behaviors commanded shall it respond with an "F".

2.6 Device ID and Capabilities Message

This message is sent by the PD to the Target Controller in response to a Device Definition Request (Message Number 100) to provide the Target Controller with the device identifier and capabilities.

Table III. Message Number 2111 – Device ID and Capabilities

Field Size	Message fields	
Bits 0 – 127	Message Header	Message Number – unsigned short
		ICD Version Number – 2 unsigned short
		Sequence ID – unsigned integer
		Reserved for future use. 4 bytes all zeros
		Length of Message – unsigned short (Includes message header and body)
Bits 128 – 175	Response ID (Table XIV)	Response Message Number – unsigned short
		Response Sequence ID – unsigned integer
Bits 176 – 239	Device ID	64 bit globally unique identifier field. This field shall contain the MAC address for Ethernet interfaces. (MSB shall be padded with zeroes)

Field Size	Message fields	
Bits 240 - 247	Additional Device Capabilities	1 Byte bit mask field. Bit 0 = MILES Shootback, Bit 1 = Muzzle Flash, Bit 2 = GPS, Bits 3 – 7 reserved for future use. Bit value of 1 indicates PD supports the capability. (e.g. 00000001 MILES support, 00000010 Muzzle Flash support, 00000111 MILES, Muzzle Flash and GPS support)

2.7 Presentation Device Status Message

This message is sent from the PD to the Target Controller in response to Command IDs (2, 6) inside the Command message to inform the Target Controller of the operational status of the device. In order for the Target Controller to maintain its internal hit count register, this message is also sent when the PD's approved hit sensor registers a hit or whenever hit sensor status changes (either via command or otherwise). This is done without the Target Controller requesting this information. This message is also sent unsolicited to the Target Controller in the case of a device fault such as a target jam. This unsolicited message will contain the Fault Field code from Table XXII.

Table IV. Message Number 2102 - Presentation Device Status

Field Size	Message fields	
Bits 0 – 127	Message Header	Message Number – unsigned short
		ICD Version Number – 2 unsigned short
		Sequence ID – unsigned integer
		Reserved for future use. 4 bytes all zeros
		Length of Message – unsigned short (Includes message header and body)
Bits 128 – 175	Response ID (Table XIV)	Response Message Number – unsigned short
		Response Sequence ID – unsigned integer
Bits 176 – 199	Unit Status (Table XVI)	Power Status – unsigned char
		OEM Fault Field – 16 bits (Table XXII)
Bits 200 – 303	Position Record (Table XVII)	Exposure – unsigned char
		Aspect – short integer
		Direction Setting – unsigned short
		Move Setting – 8-bit enumeration
		Speed (MPH) – 32-bit floating point number
		Track Position – unsigned short
		Device Type – 8-bit enumeration
Bits 304 – 391	Hit Sensor Status (Table XVIII)	Hit Count – unsigned short
		ON/OFF – 8-bit enumerated type
		Reaction – 8-bit enumerated type
		Hits To Kill – unsigned short
		Sensitivity – unsigned short

Field Size	Message fields
	Mode – 8-bit enumeration
	Burst Separation – unsigned short

Note: If the Hit Count is equal to Hits to Kill and an Expose Command is issued, the Presentation Device shall take no action and shall stay concealed.

2.8 Configure MILES Shootback Command Message

This command is sent by the Target Controller to configure MILES Shootback on Devices which support that capability. Devices supporting this capability shall respond with a MILES Shootback Status Message (2115) indicating the updated status. PDs that do not support MILES Shootback shall respond with a negative command acknowledgement (Acknowledge Response = 'F') when receiving this command.

Table V. Message Number 2114 - Configure MILES Shootback Command

Field Size	Message fields	
Bits 0 – 127	Message Header	Message Number – unsigned short
		ICD Version Number – 2 unsigned short
		Sequence ID – unsigned integer
		Reserved for future use. 4 bytes all zeros
		Length of Message – unsigned short (Includes message header and body)
Bits 128 – 167	MILES Record (Table XIX)	Basic MILES Code – unsigned char
		Ammo Type – unsigned char
		Player ID# – unsigned short
		Fire Delay – unsigned char

2.9 MILES Shootback Status Message

This message is sent by Presentation Devices that support MILES Shootback in order to communicate the current status to the Target Controller. If supported, this message shall be sent by the PD in response to Command ID 2. This message shall also be sent in response to a Configure MILES Shootback Command (Message Number 2114).

Table VI. Message Number 2115 - MILES Shootback Status

Field Size	Message fields	
Bits 0 – 127	Message Header	Message Number – unsigned short
		ICD Version Number – 2 unsigned short
		Sequence ID – unsigned integer
		Reserved for future use. 4 bytes all zeros
		Length of Message – unsigned short (Includes message header and body)
Bits	Response ID	Response Message Number – unsigned short

Field Size	Message fields	
128 – 175	(Table XIV)	Response Sequence ID – unsigned integer
Bits 176 – 215	MILES Record (Table XIX)	Basic MILES Code – unsigned char
		Ammo Type – unsigned char
		Player ID# – unsigned short
		Fire Delay – unsigned char

2.10 Configure Muzzle Flash Command Message

This command is sent by the Target Controller to configure Muzzle Flash simulation on Devices which support that capability. Devices supporting this capability shall respond with a Muzzle Flash Simulation Status Message (2112) indicating the updated status. PDs that do not support Muzzle Flash Simulation shall respond with a negative command acknowledgement (Acknowledge Response = 'F') when receiving this command.

Table VII. Message Number 2110 - Configure Muzzle Flash Command

Field Size	Message fields	
Bits 0 – 127	Message Header	Message Number – unsigned short
		ICD Version Number – 2 unsigned short
		Sequence ID – unsigned integer
		Reserved for future use. 4 bytes all zeros
		Length of Message – unsigned short (Includes message header and body)
Bits 128 – 159	Muzzle Flash Simulation Record (Table XX)	On/Off – Boolean (0 = Off)
		Mode – 8-bit enumeration
		Initial Delay – unsigned char
		Repeat Delay – unsigned char

2.11 Muzzle Flash Simulation Status Message

This message is sent by Presentation Devices that support muzzle flash simulation in order to communicate the current status to the Target Controller. If supported, this message shall be sent by the PD in response to Command ID 2. This message shall also be sent in response to a Configure Muzzle Flash Command (Message Number 2110)

Table VIII. Message Number 2112 - Muzzle Flash Simulation Status

Field Size	Message fields	
Bits 0 – 127	Message Header	Message Number – unsigned short
		ICD Version Number – 2 unsigned short
		Sequence ID – unsigned integer
		Reserved for future use. 4 bytes all zeros
		Length of Message – unsigned short (Includes message header and body)

Field Size	Message fields	
Bits 128 – 175	Response ID (Table XIV)	Response Message Number – unsigned short
		Response Sequence ID – unsigned integer
Bits 176 – 207	Muzzle Flash Simulation Record (Table XX)	On/Off – Boolean (0 = Off)
		Mode – 8-bit enumeration
		Initial Delay – unsigned char
		Repeat Delay – unsigned char

2.12 GPS Location Message

This message is sent by Devices supporting GPS (i.e. those having an attached GPS receiver). The purpose of the message is to inform the Target Controller of the GPS signal quality and where the target is currently located. After connecting to the Target Controller, the PD must report this data every 10 meters traveled. Moving targets (MIT/MAT) shall also report GPS location when detecting that carrier motion has stopped after having been in motion. All PDs supporting GPS must send this message when a command is received with a GPS Location Request Command ID (Command ID = 7). When available, GPS Location data will be preferred over track position for determining target location. PDs that do not support GPS shall never send a GPS Location Message and shall respond with a negative command acknowledgement (Acknowledge Response = 'F') when receiving a command requesting GPS location.

Table IX. Message Number 2113 - GPS Location

Field Size	Message fields	
Bits 0 – 127	Message Header	Message Number – unsigned short
		ICD Version Number – 2 unsigned short
		Sequence ID – unsigned integer
		Reserved for future use. 4 bytes all zeros
		Length of Message – unsigned short (Includes message header and body)
Bits 128 - 175	Response ID (Table XIV)	Response Message Number – unsigned short
		Response Sequence ID – unsigned integer
Bits 176 – 279	GPS Location Record (Table XXI)	GPS Figure of Merit (FOM) – 8-bit enumeration
		Integral Latitude – unsigned short
		Fractional Latitude – unsigned integer
		Integral Longitude – unsigned short
		Fractional Longitude – unsigned integer

2.13 Command Behavior

The table below specifies the fields from the Event Command Message (2100) that are to be read and applied by the PD for each Command ID, and the type of message that the PD shall respond with.

Table X. Command Behavior

Command ID	Command Fields Applied	PD Response Message
0 – No Event (default)	NONE	Command Ack (2101)
1 – Reserved for Future Use	NONE	Command Ack (2101)
2 – Status Request	NONE	Presentation Device Status (2102) MILES Shootback Status (2115) if supported Muzzle Flash Status (2112) if supported
3 – Expose Request	Exposure Aspect	Command Ack (2101)
4 – Reset Device	NONE	Command Ack (2101)
5 – Move Request	Direction Move Speed	Command Ack (2101)
6 – Configure Hit Sensor	ON/OFF Hit Count Reaction Hits To Kill Sensitivity Mode Burst Separation	Presentation Device Status (2102)
7 – GPS Location Request	NONE	GPS Location (2113)

Note: For Moving Targets, if a reset device command is issued, the mover shall return to its "starting position" for the exercise step. All values (hit count, shoot back timing, etc) shall also return to the initial exercise step value. Some movers may be pre-positioned to a location other than "home" (i.e., the docking station), and should return to that point/position if "reset". Staying at the same position at the time of the reset command is not allowable.

2.14 Presentation Device Message Components

This paragraph specifies the data types and records that will be contained in the message set described above.

2.15 Command ID

The Command ID is sent in the command message from the Target Controller to inform the PD as to which operation is to be performed. All commands require the PD to respond.

Table XI. Command ID

	Variable Type	Definition	Comments
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1	Enumerated Type	Unique identifier of this command	0 – No Event (default) 1 – Reserved for Future Use 2 – Status Request 3 – Expose Request 4 – Reset Device 5 – Move Request 6 – Configure Hit Sensor 7 – GPS Location Request
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2.16 Exposure Record

The Exposure Record is sent in the command message from the Target Controller to inform the PD as to what parameters and/or positions to set the target presentation.

Table XII. Exposure Record

	Variable Type	DEFINITION	COMMENTS
1	Unsigned char	Exposure of the target	The value in this field informs the PD to place the presentation device to any position inclusive of between “0 = fully concealed to 90 = fully exposed”. (0 – default) 0 – 90 (degrees)
2	Short integer	Aspect of the target	The value in this field sets the aspect of the presentation device. “-180 = target facing full left to 180 = target facing fully right. (0 – default) -180 to 180 (degrees)
3	Unsigned short	Direction	The value in this field sets the direction for movement of a trackless moving presentation device. “0 = True North (default). 0 – 359 Degrees

	Variable Type	DEFINITION	COMMENTS
4	8-bit enumeration	Move	The value in this field sets the direction for a moving presentation device using a track (1 = Moving away from a 'HOME' position and 2 = Moving toward the 'HOME' position). For a trackless moving presentation device, this value is used in conjunction with the 'Direction' value to determine how and where the device will move. A value of 0 should be interpreted as the target being stopped, regardless of the speed value. 0 – Stop (default) 1 – Forward 2 – Reverse
5	Float	Speed (MPH)	The value in this field sets the speed at which a moving presentation device should move. (0 – default) 0 – 20 MPH

2.17 Sensor Record

The Sensor Record is sent in the command message from the Target Controller to inform the PD as to what parameters and/or positions are desired for the onboard hit sensor.

Table XIII. Sensor Record

	Variable Type	Definition	Comments
1	8-bit enumeration	ON/OFF	The value in this field represents when the hit sensor should begin sensing hits. 0 – Off (default) 1 – On Immediately 2 – On at Commanded Position 3 – Off at Commanded Position
2	Unsigned Short	Hit Count	The value in this field represents the number of hits registered by the hit sensor since the last reset. (0 – default) 0 – 10
3	8-bit enumeration	Reaction (Table XXIII)	This value indicates how the PD should react when killed (Hit Count >= Hits to Kill) 0 – Fall (default) 1 – Kill 2 – Stop 3 – Fall and Stop 4 – Bob

	Variable Type	Definition	Comments
4	Unsigned Short	Hits to Kill	Number of times the target must be hit to register a kill (1 – default). 1 – 10
5	Unsigned Short	Sensitivity	This value will set the sensitivity of the hit sensor in order to record a hit. A value of 1 is least sensitive, 15 is most sensitive. (1 – default). 1 – 15
6	8-bit enumeration	Mode	The value in this field informs the target to count every impact as a hit or treat a string of hits separated by a defined interval as one hit. The ‘NCHS’ mode is used with a non-contact hit sensor. 0 – NCHS 1 – Single (default) 2 – Burst
7	Unsigned Short	Burst Separation	The time separation between object impacts on the target face that the target uses to differentiate hits when in the “Burst” mode. (250 – default) 100 – 10000 milliseconds

2.18 Response ID

The Response ID is used by the Target Controller to identify what message the device is responding to.

Table XIV. Response ID

	Variable Type	Definition	Comments
1	Unsigned short	Response Message Number	This number informs the Target Controller what type of message the PD is responding to. For unsolicited status, this field shall be set to zero. Otherwise, it shall be set to the message number of the command.
2	Unsigned integer	Response Sequence ID	This number informs the Target Controller that the response is the proper response that the device is responding to. For unsolicited status, this value should be set to zero. Otherwise, this value shall be set to the sequence ID of the command. (Default = 0)

2.19 Acknowledge Response

The Acknowledge Response is used to inform the Target Controller that the message sent was received by the PD and, based upon the value returned, whether or not it can or will perform the command requested. This response is used for commands that do not return status parameters requested by other command event IDs.

Table XV. Acknowledge Response

	Variable Type	Definition	Comments
1	Char	Acknowledgement from the PD to the Target Controller of receipt of the command.	This value will inform the Target Controller whether the message was received and whether the device can comply with the command. (Default = "S") "S" – Received and complied. "F" – Received, can't comply.

2.20 Unit Status

The unit status provides the Target Controller information on the operational status of the PD. The manufacturer will provide information about possible operational errors within their unit by setting specific bits in the Original Equipment Manufacturer (OEM) Fault Field.

Table XVI. Unit Status

	Variable Type	Definition	Comments
1	Unsigned char	Power Status	The value in this field represents the power status: 0 – Shore Power (default) 1 – Alternate Power Source
2	Bit Field	Error Codes	OEM Fault Field (default = 0000 Hex) 0000 – Fully Operational

2.21 Position Record

The Position Record is received in the acknowledge and status messages from the PD to inform the Target Controller as to what parameters and/or positions that the target representation is in.

Table XVII. Position Record

	VARIABLE TYPE	DEFINITION	COMMENTS
1	Unsigned char	Exposure of the target	The value in this field informs the Target Controller what position the presentation device is in. "0 = fully concealed to 90 = fully exposed". (0 – default) When transitioning between exposed and concealed states in either direction (exposing or concealing), the PD shall send a value of 45. 0 – 90 (degrees)

	VARIABLE TYPE	DEFINITION	COMMENTS
2	Short integer	Aspect of the target	The value in this field informs the Target Controller what the aspect of the presentation device is currently at. “-180 = target facing full left to 180 = target facing fully right. (0 – default) –180 to 180 (degrees)
3	Unsigned short	Direction	The value in this field informs the Target Controller of the direction of movement of the trackless presentation device. “0 = True North (default). 0 – 359 Degrees
4	8-bit enumeration	Move setting	The value in this field informs the Target Controller of the direction a moving presentation device using a track is moving. (1 = Moving away from a ‘HOME’ position and 2 = Moving toward the ‘HOME’ position). For a trackless moving presentation device, this value is used in conjunction with the ‘Direction’ value to determine how and where the device is moving. 0 – Stop (default) 1 – Forward 2 – Reverse
5	Float	Speed (MPH) setting	The value in this field informs the Target Controller of the speed at which a moving presentation device is moving. (0 – default) 0 – 20 MPH
6	Unsigned short	Track Position	The value in this field informs the Target Controller of the location of the device on the track in relation to the ‘HOME’ position “0 = ‘HOME’ position (0 – default). 0 – 1000 (meters)
7	8-bit Enumeration	Device Type	The value in this field informs the Target Controller of what type of PD it is in communication with. 0 - default 1 – Stationary Infantry Target (SIT) 2 – Moving Infantry Target (MIT) 3 – Stationary Armor Target (SAT) Light 4 – Stationary Armor Target (SAT) Heavy 5 – Moving Armor Target (MAT)

2.22 Hit Sensor Status

The Hit Sensor Status is received in the acknowledge message from the PD to inform the Target Controller as to what parameters and/or positions set for the onboard hit sensor and to inform the Target Controller that a hit has occurred.

Table XVIII. Hit Sensor Status

	Variable Type	Definition	Comments
1	Unsigned Short	Hit Count	The value in this field represents the number of hits registered by the hit sensor since the last reset. (0 – default) 0 – 10
2	8-bit enumeration	ON/OFF	The value in this field represents what setting was selected for the hit sensor to begin sensing hits. 0 – Off (default) 1 – On Immediately 2 – On at Commanded Position 3 – Off at Commanded Position
3	8-bit enumeration	Reaction	The value in this field informs the Target Controller what reaction was set for the target to perform upon Kill (Hit Count \geq Hits to Kill). 0 – Fall (default) 1 – Kill 2 – Stop 3 – Fall and Stop 4 – Bob
4	Unsigned Short	Hits to Kill	The value in this field informs the Target Controller of the current setting for ‘hits to kill’ (1 – default). 1 – 10
5	Unsigned Short	Sensitivity	This value will inform the Target Controller the setting of the sensitivity for the hit sensor to record a hit. A value of 1 is least sensitive, 15 is most sensitive. (1 – default). 1 – 15
6	8-bit enumeration	Mode	The value in this field informs the Target Controller as to what mode the PD is in for detecting hits. 0 – NCHS 1 – Single (default) 2 – Burst

	Variable Type	Definition	Comments
7	Unsigned Short	Burst Separation	The value in this field informs the Target Controller of what time separation between object impacts on the target face that was select when in the “Burst” mode. (250 – default) 100 – 10000 milliseconds

2.23 MILES Record

The MILES Record is sent in the command message from the Target Controller to inform the PD as to what parameters are desired for the MILES shootback device. It is also included in the PD Status message to inform the Target Controller what parameters are set I n the PD for the shootback device.

The codes shown in this table are from PMT 90-S002J, Multiple Integrated Laser Engagement System (MILES) Communication Code (MCC) Standard, dated 19 January 2005. In the event of a discrepancy between the MCC and this ICD, the latest release of the MCC supersedes the information in the table below.

Table XIX. MILES Record

	Variable Type	Definition	Comments
1	Unsigned Char	Basic MILES Code	The value in this field sets what type of weapon should be fired by the shootback device. 00 – Universal Kill (default) 01 – Hellfire 02 – Unassigned 03 – AT-3 Sagger 04 – Unassigned 05 – Unassigned 06 – Unassigned 07 – Tow, AT-5 (Konkurz) 08 – Dragon 09 – Fire & Forget Missile 10 – 125 mm 11 – Claymore mine 12 – 105 mm Hit 13 – 122 mm Artillery DF 14 – 73 mm, 2.75” Rocket, 57 mm 15 – Viper, RPG-7, Carl Gustav, AT-4 16 – 120 mm 17 – 90 mm 18 – 152 mm, 155 mm 19 – 40 mm Grenade 20 – Rockeye, SMAW

	Variable Type	Definition	Comments
			21 – 30 mm, GAU-8 22 – 25 mm, ZSU-23/4 23 – 30 mm (NTC HIND-D), Vulcan 24 – Heavy machine gun (M2, M85) 25 – Chaparral, SAM 26 – Stinger 27 – Small Arms (M16, M60 MG, Coax) 28 – Heavy Weapon Miss 29 – Light Weapon Miss 30 – Reset (Aircraft), Resurrect (Ground) 31 – Heavy Spare Miss 32 – RF SAM 33 – SA-14 34 – AAA-2 30 mm 35 – Controller Gun Utility Codes 36 – Reset (Ground), Resurrect (Aircraft)
2	Unsigned Char	Ammo Type	The value in this field sets the selected ammo type for either Bluefor or Opfor (00 – default) 00 – FF Hexadecimal
3	Unsigned Short	Player ID#	The value in this field sets the identification number for a particular player. (1 – default) 1 – 330
4	Unsigned Char	Fire Delay	The value in this field sets what delay is injected between target exposure and when the shootback device fires. (0 – default) 0 – 60 seconds

2.24 Muzzle Flash Simulation Record

The Muzzle Flash Simulation Record is present in the Configure Muzzle Flash Command to configure the muzzle flash simulation attributes. This record is also present in the Muzzle Flash Simulation Status message from the PD to inform the Target Controller as to what parameters are set in the PD.

Table XX. Muzzle Flash Simulation Record

	Variable Type	Definition	Comments
1	Boolean	ON/OFF	Indicates whether the Muzzle Flash Simulation is on or off. Off = 0, On = 1

	Variable Type	Definition	Comments
2	8-bit enumeration	Mode	Single or Burst mode. Single = 0, Burst = 1
3	Unsigned short	Initial Delay	This value indicates how many seconds after the target becomes exposed before the muzzle flash should fire. If the target is killed or conceals before the time elapses, the muzzle flash should not fire. 0 – 60 seconds
4	Unsigned short	Repeat Delay	This value indicates the number of seconds between subsequent muzzle flashes. If the value is zero, only one muzzle flash should occur, “Initial Delay” seconds after the target exposes. 0 – 60 seconds

2.25 GPS Location Record

The GPS Location Record is received in the GPS Location message from PDs that support GPS to inform the Target Controller of GPS signal quality and where the target is currently located.

Table XXI. GPS Location Record

	Variable Type	Definition	Comments
1	8-bit enumeration	GPS Figure Of Merit (FOM)	Indicates the quality of the GPS data being received. 0 = No GPS Lock (Default), 1 = Good (Valid GPS Lock, at least 4 satellites). When FOM value is zero, all other data contained in the GPS Location Record shall be set to zero by the PD.
2	Short integer	Integral Latitude	Integer portion of latitude, measured in degrees. Positive values for northern hemisphere, negative values for southern hemisphere. (-90 <= Integral Latitude <= 90)
3	Unsigned integer	Fractional Latitude	Fractional latitude value measured in .000001 degree increments. Latitude value = Integral Latitude + (Fractional Latitude * 1000000)
4	Short integer	Integral Longitude	Integer portion of longitude, measured in degrees. (-180 <= Integral Longitude <= 180)
5	Unsigned integer	Fractional Longitude	Fractional longitude value measured in .000001 degree increments. Longitude value = Integral Longitude + (Fractional Longitude * 1000000)

2.26 Presentation Device Fault Field Codes

The table below provides an enumeration of the error codes. It is not a requirement that manufacturers support all fault codes, however any fault codes that are generated must be present in the table below.

* OEM Fault Field (default = 0000 Hex) 0000 – Fully Operational

Table XXII. Presentation Device Fault Field Codes

Error Code (Interpreted Decimal value)	Description
0	Normal
1	Both left and right limits are active
2	Invalid direction requested
3	Invalid speed requested
4	Speed 0 requested
5	Stopped at right limit
6	Stopped at left limit
7	Stopped by distance encoder
8	Emergency stop
9	No movement detected
10	Over-speed detected
11	Unassigned
12	Wrong direction detected
13	stopped due to stop command
14	Lifter stuck at limit
15	Actuation was not completed
16	Did not leave conceal switch
17	Did not leave expose switch
18	Did not reach expose switch
19	Did not reach conceal switch
20	Low battery detected
21	Engine has stopped
22	IR augmentation failure
23	Audio subsystem fault
24	Miles subsystem fault
25	Thermal subsystem fault
26	Hit sensor disconnected
27	Invalid target type
28	Incorrectly formatted RF packet
29	Incorrect checksum
30	Unsupported command
31	Invalid Exception Code Returned

2.27 Presentation Device Reaction when Killed

The presentation device will have 5 possible kill reaction types (“Kill” is defined as PD hit count being greater than or equal to the configured Hits-To-Kill value). These are shown in the table below.

Table XXIII. Target Reaction When Killed

	Target Reaction	Comments
0	FALL	Stationary target will conceal. Moving target will conceal and continue to limit switch.
1	KILL	Stationary target will conceal. Moving target will stop travel and conceal.
2	STOP	Stationary target will have no reaction. Moving target will stop travel. The target will NOT conceal.
3	FALL and STOP	Stationary target will conceal. Moving target will stop travel and conceal.
4	BOB	Stationary targets will conceal and expose for each detected hit when hit count is less than the current hits to kill setting. When the hit count reaches or exceeds hits to kill, the target will conceal. Moving targets will conceal and expose for each detected hit when hit count is less than the current hits to kill setting. When the hit count reaches or exceeds hits to kill, the target will conceal. If in motion, the target will continue to move until either a limit switch is reached or the hit count reaches or exceeds the current hits to kill setting, at which point the target will stop. Upon reaching a limit switch, the target will be concealed.

2.28 FASIT Target Controller to Presentation Device Messaging

The sequence diagrams that follow illustrate the messaging sequence for the primary PD functions. These diagrams are intended to supplement the textual descriptions given earlier in this document.

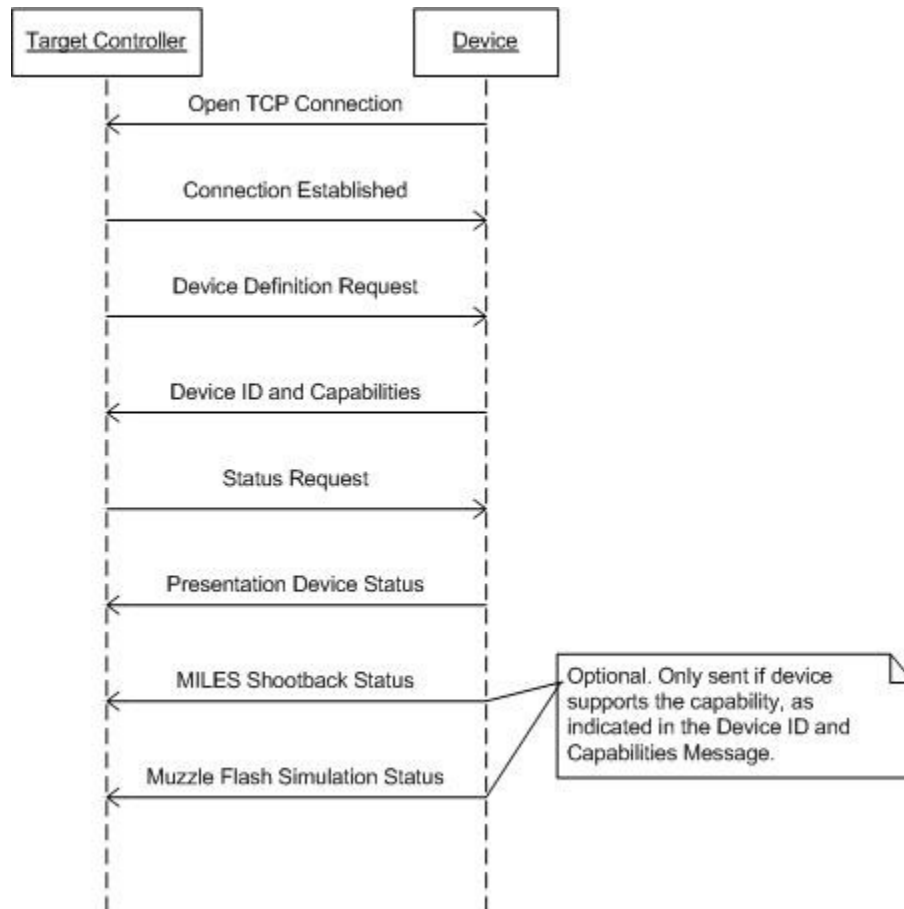
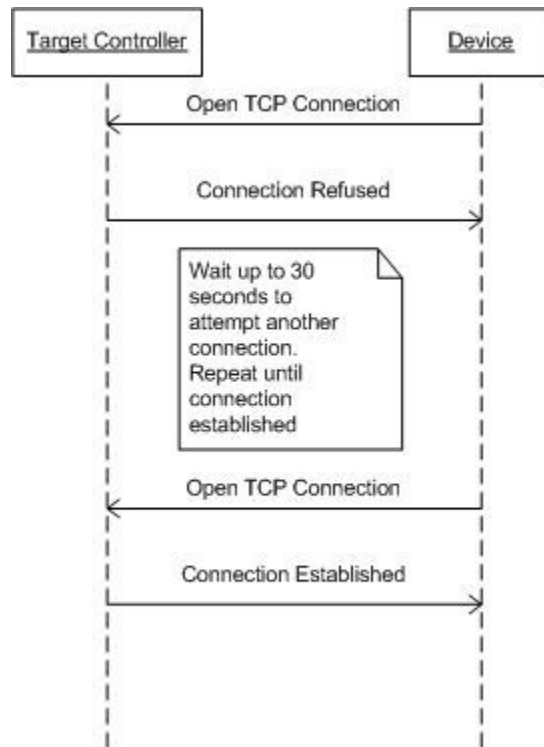
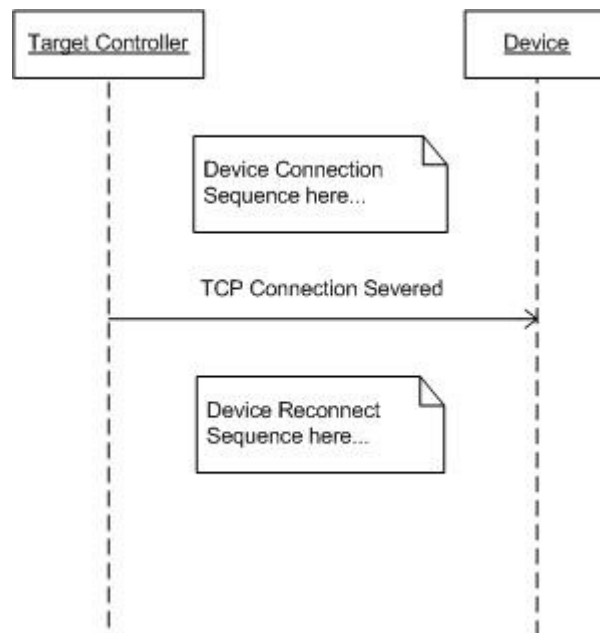
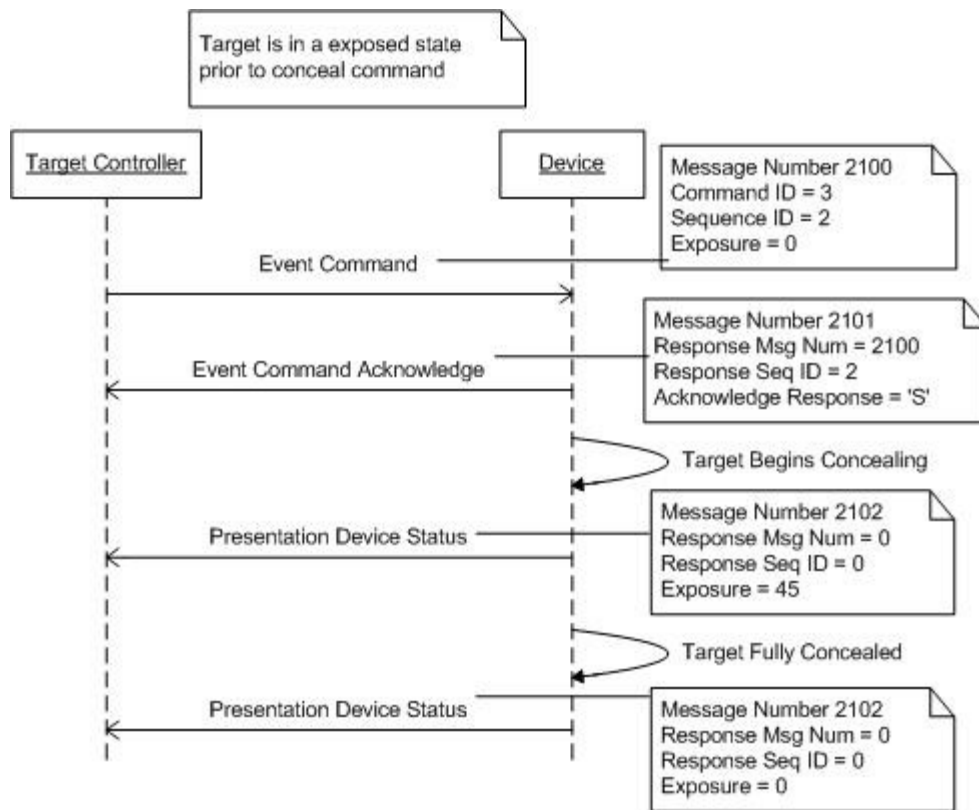
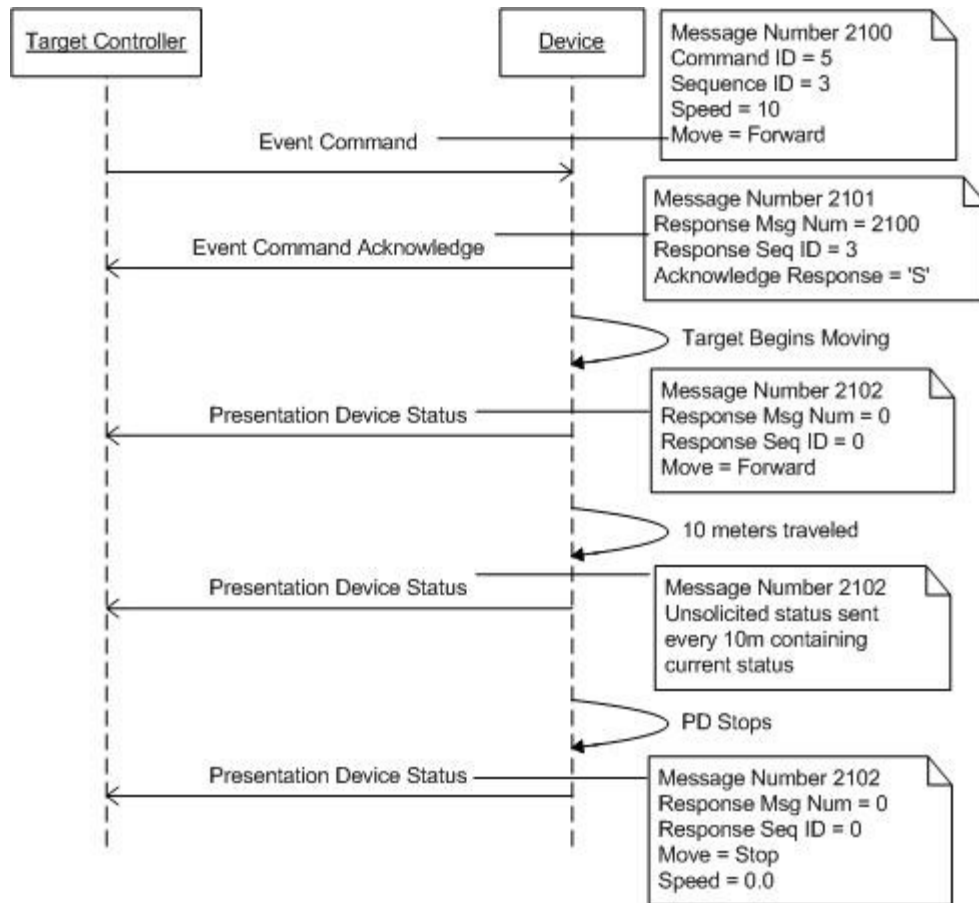


Figure 2. Device Connection

**Figure 3. Device Reconnect****Figure 4. Device Connection Severed**



**Figure 6. Conceal Request**

**Figure 7. Movement Request**

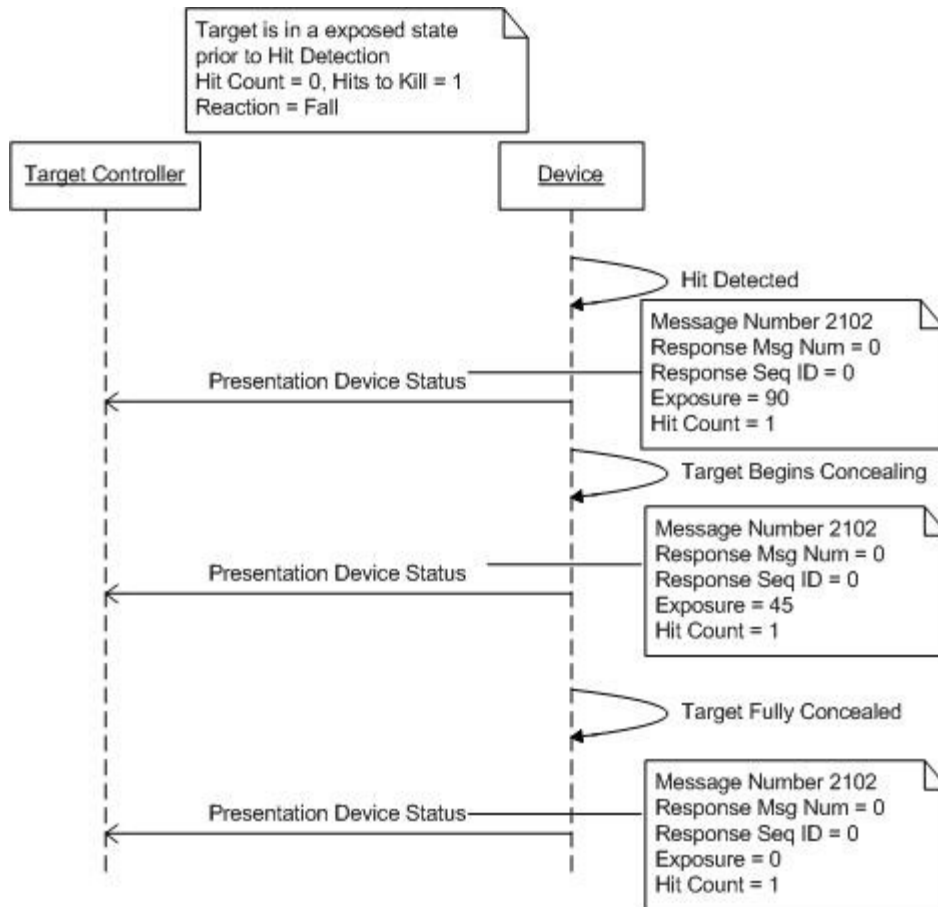


Figure 8. Hit Detection

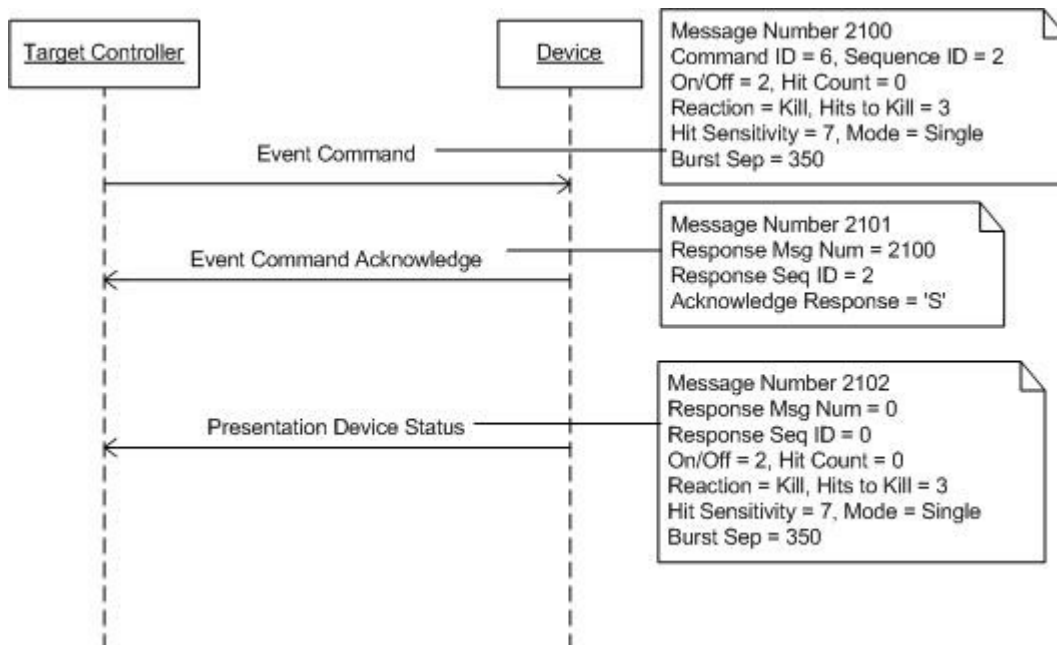
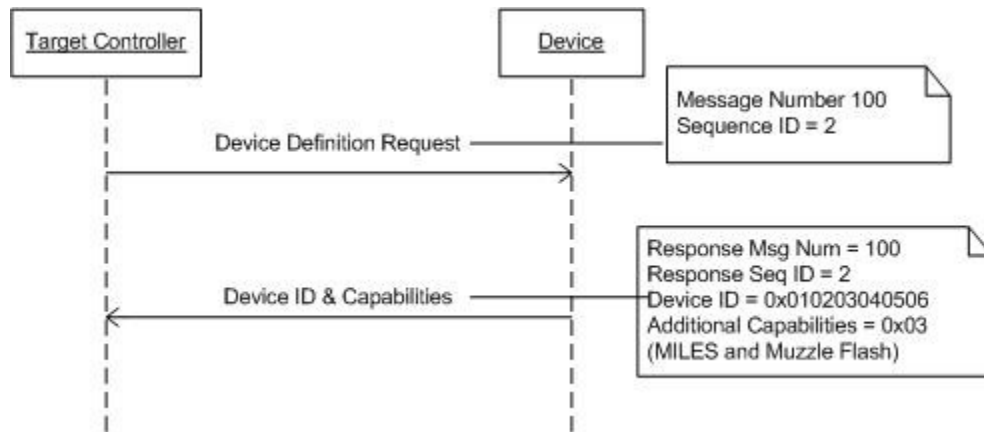
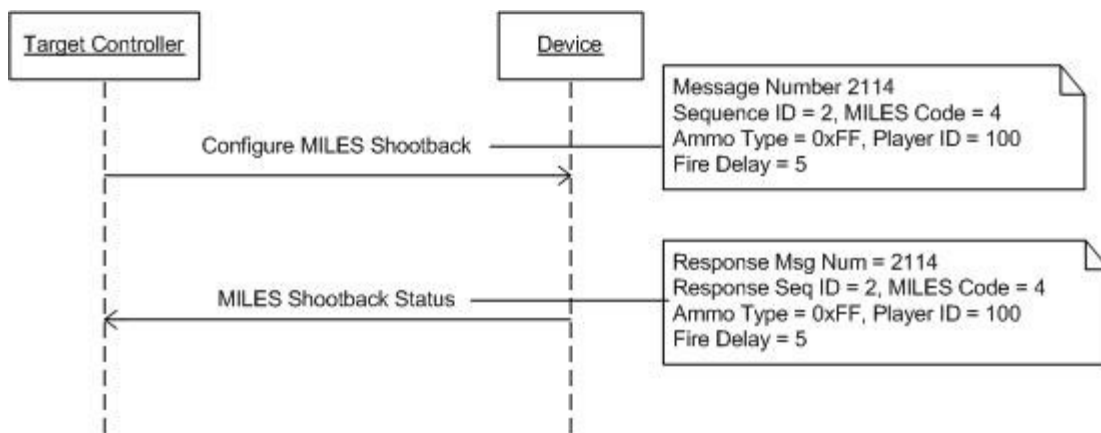
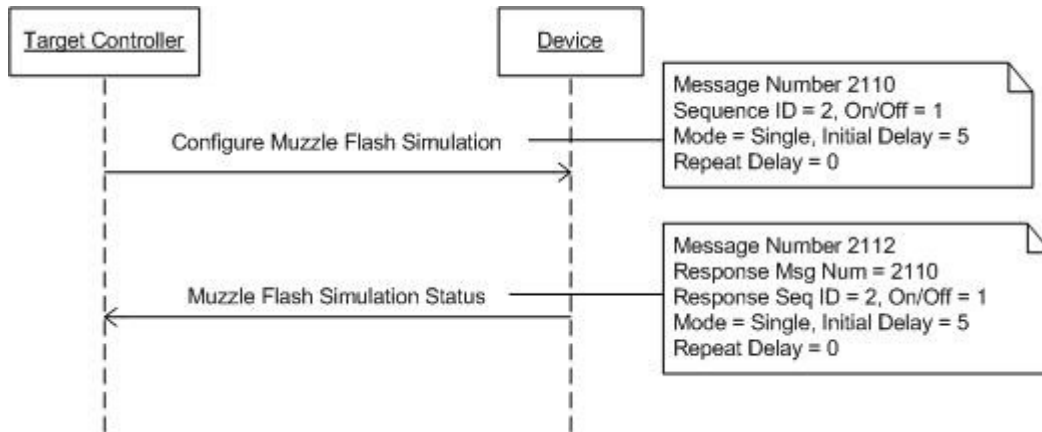
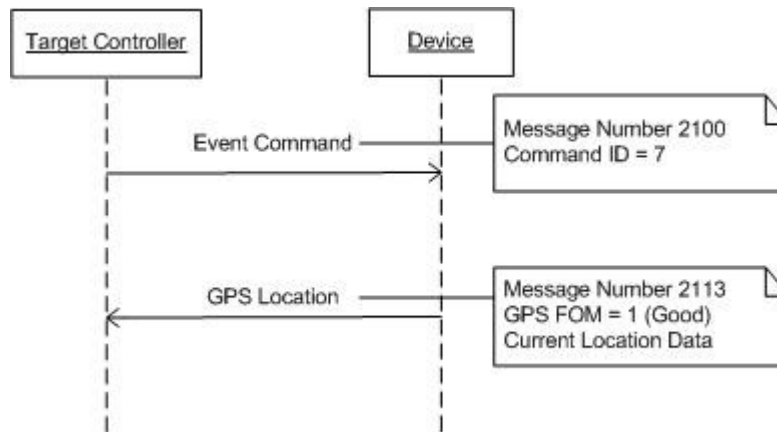


Figure 9. Configure Hit Sensor

**Figure 10. Device Definition Request****Figure 11. Configure MILES Shootback**

**Figure 12. Configure Muzzle Flash Simulation****Figure 13. GPS Location Request**