MetricsManager™  
Generic Message Protocol

Data Communication Standard

Note: This document is public document, not Confidential. we create this document for all customers to use our API to transfer their data to our service.

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## Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| Revision # | Date | Description | Author |
| 1.0 | Dec 16, 2015 | Initial version. | William Liu |
| 1.1 | May 19, 2016 | WM Message config change to wmconfig | William Liu |
| 1.2 | May 26, 2016 | Create PM definition | William Liu |
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# General Message Structure

The Generic Message Protocol consists of three main sections: Header, Body, and Binary.

{

“header” : {

“time” = 1454464353,

“timeoffset” = -28800,

“source” = “MOTIONMETRICS”,

“priority” = 1

},

“body” : {

“key” : “value”,

“array” : [

{“key1” : “value1”},

{“key2” : “value2”}

],

“nestedJSON” : {

“keyA” : “valueA”,

“keyB” : “valueB”

}

},

“binary” : [

{ “filename” : “name of file”, “data” : “*Base64 binary data*”}

]

}

## Header

Format is mandatory and must include the following:

|  |  |  |  |
| --- | --- | --- | --- |
| Key | Value Type | Value Range | Description |
| time | Unsigned Integer |  | UNIX UTC Time of message sent |
| timeoffset | Signed Integer | -43200 to 50400 | UNIX time offset of location where message was sent |
| source | String |  | Name of data source |
| priority | Unsigned Integer |  | Message priority. Larger numbers have higher priority. Default is set to 1 (lowest priority). |

## Body

Main body of the message. Any JSON formatted data is accepted.

## Binary

JSON array of JSON objects, each representing a binary data file. There is no limit on number of binary data files attached. If there are no binary data files to attach, the binary section can be omitted.

The JSON objects in the array must include the following:

|  |  |  |  |
| --- | --- | --- | --- |
| Key | Value Type | Value Range | Description |
| filename | String |  | Name of the file being sent. |
| data | String |  | **Base64 encoded** binary data of the file being sent. |

# Motion Metrics Examples

## TM Log Data Transmission

{

“header” : {

“time” = 1454464353,

“timeoffset” = -28800,

“source” = “MOTIONMETRICS”,

“priority” = 1

},

“body” : {

“uuid” : “550e8400-e29b-41d4-a716-446655440000”,

“equipmentid” : “Shovel7”,

“subsystem” : “TM”,

“softver” : “0.7.2\_TVM\_SH:PH:2800XPC\_r1010M”,

“logver” : 23,

“logtime” : 1454355580,

“logtimeoffset” : 7200,

“nteeth” : 8,

“alarmstate” : 4,

“toothstatus” : [

{“toothno” : 1, “toothstatus” : 0},

{“toothno” : 2, “toothstatus” : 0},

{“toothno” : 3, “toothstatus” : 0},

{“toothno” : 4, “toothstatus” : 4},

{“toothno” : 5, “toothstatus” : 0},

{“toothno” : 6, “toothstatus” : 0},

{“toothno” : 7, “toothstatus” : 1},

{“toothno” : 8, “toothstatus” : 0}

],

“cropbounds” : [

{“type” : “bucket”, “rect” : [5, 235, 320, 240]},

{“type” : “rear”, “rect” : [330, 235, 320, 240]},

{“type” : “left”, “rect” : [5, 480, 320, 240]},

{“type” : “right”, “rect” : [330, 480, 320, 240]},

]

},

“binary” : [

{ “filename” : “TM\_2015.11.09\_09.58.51.jpg”, “data” : “*Base64 binary data*”}

]

}

## TM Legacy Log Data Transmission

{

“header” : {

“time” = 1454464353,

“timeoffset” = -28800,

“source” = “MOTIONMETRICS”,

“priority” = 1

},

“body” : {

“uuid” : “550e8400-e29b-41d4-a716-446655440000”,

“subsystem” : “TM-LEGACY”

},

“binary” : [

{ “filename” : “TM\_2015.11.09\_09.58.51.jpg”, “data” : “*Base64 binary data*”}

]

}

## WM Log Data Transmission

{

“header” : {

“time” = 1454464353,

“timeoffset” = -28800,

“source” = “MOTIONMETRICS”,

“priority” = 1

},

“body” : {

“uuid” : “550e8400-e29b-41d4-a716-446655440000”,

“equipmentid” : “Shovel7”,

“subsystem” : “WM”,

“softver” : “0.7.2\_TVWM\_SH:PH:2800XPC\_r1010M”,

“logver” : 7,

“logtime” : 1454355580,

“logtimeoffset” : 7200,

“nteeth” : 7,

“wmconfig” : {

“toothProportionNew” : 0.125,

“toothProportionWorn” : 0.0625,

“bucketWidthMeters” : 4.60

},

“detection” : {

“mse” : 139.212

},

“bucketWidthPX” : 218.237,

“toothmeasurements” : [

{

“toothno” : 1,

“rawLengthPX” : 28.7948,

“rawLengthM” : 0.527769,

“toothX” : 211.548,

“toothY" : 341.43,

“toothTilt” : 51

},

{

“toothno” : 2,

“rawLengthPX” : 27.8342,

“rawLengthM” : 0.510163,

“toothX” : 249.118,

“toothY" : 338.319,

“toothTilt” : 50

},

{

“toothno” : 3,

“rawLengthPX” : 27.1869,

“rawLengthM” : 0.498299,

“toothX” : 285.582,

“toothY" : 337.668,

“toothTilt” : 49

},

{

“toothno” : 4,

“rawLengthPX” : 28.8814,

“rawLengthM” : 0.529356,

“toothX” : 320.943,

“toothY" : 339.267,

“toothTilt” : 48

},

{

“toothno” : 5,

“rawLengthPX” : 26.7662,

“rawLengthM” : 0.490589,

“toothX” : 356.303,

“toothY" : 343.059,

“toothTilt” : 44

},

{

“toothno” : 6,

“rawLengthPX” : 30.7013,

“rawLengthM” : 0.562714,

“toothX” : 394.425,

“toothY" : 349.606,

“toothTilt” : 41

},

{

“toothno” : 7,

“rawLengthPX” : 31.6426,

“rawLengthM” : 0.579966,

“toothX” : 429.785,

“toothY" : 357.959,

“toothTilt” : 41

}

],

“cropbounds” : [

{“type” : “bucket”, “rect” : [5, 70, 640, 480]},

{“type” : “analysis”, “rect” : [88, 555, 475, 155]}

]

},

“binary” : [

{ “filename” : “WM\_2015.11.09\_11.14.30.jpg”, “data” : “*Base64 binary data*”}

]

}

## WM Legacy Log Data Transmission

{

“header” : {

“time” = 1454464353,

“timeoffset” = -28800,

“source” = “MOTIONMETRICS”,

“priority” = 1

},

“body” : {

“uuid” : “550e8400-e29b-41d4-a716-446655440000”,

“subsystem” : “WM-LEGACY”

},

“binary” : [

{ “filename” : “WM\_2015.11.09\_11.14.30.jpg”, “data” : “*Base64 binary data*”}

]

}

## FM Log Data Transmission

{

“header” : {

“time” = 1454464353,

“timeoffset” = -28800,

“source” = “MOTIONMETRICS”,

“priority” = 1

},

“body” : {

“uuid” : “550e8400-e29b-41d4-a716-446655440000”,

“equipmentid” : “Shovel7”,

“subsystem” : “FM”,

“softver” : “0.7.2\_TVFM\_SH:PH:2800XPC\_r1010M”,

“logver” : 12,

“logtime” : 1454355580,

“logtimeoffset” : 7200,

“bucketWidthCM” : 460,

“bucketWidthPX” : 360,

“verificationResult” : “good”,

“cropbounds” : [

{“type” : “bucket”, “rect” : [84, 274, 503, 248]},

{“type” : “roi”, “rect” : [214, 344, 257, 104]}

]

},

“binary” : [

{ “filename” : “FM\_2015.11.09\_09.55.19.jpg”, “data” : “*Base64 binary data*”}

]

}

## FM Legacy Log Data Transmission

{

“header” : {

“time” = 1454464353,

“timeoffset” = -28800,

“source” = “MOTIONMETRICS”,

“priority” = 1

},

“body” : {

“uuid” : “550e8400-e29b-41d4-a716-446655440000”,

“subsystem” : “FM-LEGACY”

},

“binary” : [

{ “filename” : “FM\_2015.11.09\_09.55.19.jpg”, “data” : “*Base64 binary data*”}

]

}

## RM Log Data Transmission

{

“header” : {

“time” = 1454464353,

“timeoffset” = -28800,

“source” = “MOTIONMETRICS”,

“priority” = 1

},

“body” : {

“uuid” : “550e8400-e29b-41d4-a716-446655440000”,

“equipmentid” : “Shovel7”,

“subsystem” : “RM”,

“softver” : “0.7.2\_TVRM\_SH:PH:2800XPC\_r1010M”,

“logver” : 9,

“logtime” : 1454355580,

“logtimeoffset” : 7200,

“radarTableSize” : 7,

“eventType” : 1,

“alarmStateThisCycle” : 1,

“alarmState” : 1,

“radarTable” : [

{

"id" : 8,

"valid" : true,

"proximity" : 5,

"isCalibrated" : true,

"XLocation" : -6.53102,

"YLocation" : 0.962466,

"PanAngle" : 177,

"TiltAngle" : 10.0584,

"Range" : 13

},

{

"id" : 13,

"valid" : true,

"proximity" : 5,

"isCalibrated" : true,

"XLocation" : -6.53102,

"YLocation" : 5.56891,

"PanAngle" : 205,

"TiltAngle" : 10.0584,

"Range" : 13

},

{

"id" : 14,

"valid" : true,

"proximity" : 5,

"isCalibrated" : true,

"XLocation" : -4.47358,

"YLocation" : 8.79969,

"PanAngle" : 231,

"TiltAngle" : 10.0584,

"Range" : 13

},

{

"id" : 15,

"valid" : true,

"proximity" : 5,

"isCalibrated" : true,

"XLocation" : -0.06875,

"YLocation" : 9.8309,

"PanAngle" : 270,

"TiltAngle" : 10.0584,

"Range" : 13

},

{

"id" : 16,

"valid" : true,

"proximity" : 5,

"isCalibrated" : true,

"XLocation" : -5.22482,

"YLocation" : 8.5247,

"PanAngle" : 316,

"TiltAngle" : 10.0584,

"Range" : 13

},

{

"id" : 18,

"valid" : true,

"proximity" : 5,

"isCalibrated" : true,

"XLocation" : 7.76848,

"YLocation" : 4.60609,

"PanAngle" : 352,

"TiltAngle" : 10.0584,

"Range" : 13

},

{

"id" : 20,

"valid" : true,

"proximity" : 5,

"isCalibrated" : true,

"XLocation" : 7.83722,

"YLocation" : -0.61873,

"PanAngle" : 4,

"TiltAngle" : 10.0584,

"Range" : 13

}

]

},

“binary” : [

{ “filename” : “RM\_2015.11.09\_09.47.32.jpg”, “data” : “*Base64 binary data*”}

]

}

## RM Legacy Log Data Transmission

{

“header” : {

“time” = 1454464353,

“timeoffset” = -28800,

“source” = “MOTIONMETRICS”,

“priority” = 1

},

“body” : {

“uuid” : “550e8400-e29b-41d4-a716-446655440000”,

“subsystem” : “RM-LEGACY”

},

“binary” : [

{ “filename” : “RM\_2015.11.09\_09.47.32.jpg”, “data” : “*Base64 binary data*”}

]

}

## PLM Log Data Transmission

{

“header” : {

“time” = 1454464353,

“timeoffset” = -28800,

“source” = “MOTIONMETRICS”,

“priority” = 1

},

“body” : {

“uuid” : “550e8400-e29b-41d4-a716-446655440000”,

“subsystem” : “LM”,

“equipmentid” : “Shovel7”,

“softver” : “0.7.2\_TVPM\_SH:PH:2800XPC\_r1010M”,

“events” : [

{

“logver” : 4,

“eventType” : 0,

“dateTime” : 2016-02-01T19:39:40”,

“utcTime” : 1454355580,

“utcTimeOffset” : 7200,

“value1” : 1,

“value2” : 0,

“value3” : 0,

“value4” : 0,

“string1” : “”,

“string2” : “”

},

{

“logver” : 4,

“eventType” : 205,

“dateTime” : 2016-02-01T19:39:41”,

“utcTime” : 1454355581,

“utcTimeOffset” : 7200,

“value1” : -1250,

“value2” : 0,

“value3” : 0,

“value4” : 0,

“string1” : “”,

“string2” : “”

}

]

}

}

## PLM Legacy Log Data Transmission

{

“header” : {

“time” = 1454464353,

“timeoffset” = -28800,

“source” = “MOTIONMETRICS”,

“priority” = 1

},

“body” : {

“uuid” : “550e8400-e29b-41d4-a716-446655440000”,

“subsystem” : “LM-LEGACY”

},

“binary” : [

{ “filename” : “LM\_2016.02.01\_19.39.40.event.csv”, “data” : “*Base64 binary data*”}

]

}

## PM (FMP) Log Data Transmission

{

“header” : {

“time” = 1454464353,

“timeoffset” = -28800,

“source” = “MOTIONMETRICS”,

“priority” = 1

},

“body” : {

“uuid” : “550e8400-e29b-41d4-a716-446655440000”,

“equipmentid” : “Shovel7”,

“subsystem” : “FMP”,

“softver” : “XXXX-XXX-XXX”,

“logver” : 12,

“logtime” : 1454355580,

“logtimeoffset” : 7200,

“user\_id” : int,

“ImageTag” : string,

“UserRoi”: string,

“GPS\_Longitude”: double,

“GPS\_Latitude”: double,

“GPS\_Altitude”: double,

“DeviceOrientation\_Q0”: double,

“DeviceOrientation\_Q1”: double,

“DeviceOrientation\_Q2”: double,

“DeviceOrientation\_Q3”: double,

“UserName”: string,

“CameraMode”: int,

“IsManuallyCorrected”: bool,

“CorrectedDate”: datetime

},

“binary” : [

{

“filename” : “FMP\_YYYY.MM.DD\_HH.mm.ss\_original.jpg”,

“data” : “*Base64 binary data*”

},

{

“filename” : “FMP\_YYYY.MM.DD\_HH.mm.ss\_matrix.cma”,

“data” : “*Base64 custom*”

}

]

}

# External Data Source Examples

## GPS Coordinates from Modular Mining Dispatch

{

“header” : {

“time” = 1454464353,

“timeoffset” = -28800,

“source” = “MODULARMINING”,

“priority” = 1

},

“body” : {

“equipmentid” : “Shovel7”,

“gpscoords” : {

“lat” : 492827291,

“long” : -123.1207375

}

}

}