DATA FIELDS
V8.10
12 November 2020.

REVISION HISTORY

Date	Version	Changes
2019-02-13	7.0	Added Sample Count to Profiling Counters
2019-05-13	8.0	Added BLE Tag data fields
2019-05-30	8.1	Added DM SensorNode Bluetooth to tag types
2019-05-30	8.2	Added notes about deprecated and infrequently used fields
2019-07-10	8.3	Added Debug Event (FID 1) event codes Added Profiling Counter (FID 21) for Initial Battery Capacity Used (9) Corrected units of Profiling Counter for Battery Capacity Used (2)
2019-09-26	8.4	Added Eddystone TLM to tag types Appended MAC address to iBeacon and Eddystone tag types
2019-10-11	8.5	Added generic tag to tag types
2019-12-03	8.6	Added more BLE tag types
2019-02-20	8.7	Added Escort BLE Fuel sensor to tag types
2019-03-11	8.8	Added Image Data (FID 31)
2020-11-12	8.10	Added Analogues 5 and 6 to Analogues description

DEVICE SUPPORT
Please note that not all data fields are supported by all Digital Matter devices.
Please check with Digital Matter if you are unsure.

RECORD HEADER
All records will start with this block.

Length = 11

Offset	Data Type	Length	Description	Unit
0	UINT16	2	Record Length	
2	UINT32	4	Sequence Number	
6	UINT32	4	RTC datetime	Seconds since 1 Jan 2013
10	BYTE	1	Log Reason	

Please refer to "DMT Log Reasons" document for the latest list of log reasons.

DATA FIELDS
Data Fields consist of a key / data pair, where the key contains metadata for the length of the field and the Field ID (FID) of the field. The key is followed by the actual data of the field.

The data can be a structure containing multiple values.

This allows for a flexible record where new data types / structures can be added to the system and the metadata in the key allows it to be backward compatible with parsers. Fields can also be repeated multiple times in a single record if required, for example fuel readings from 2 fuel tanks.

Integrators will note that some of the fields have been deprecated. Others are rarely used, and use depends on the device type. It is worth discussing which fields to prioritize with a Digital Matter Engineer.

KEY DETAILS

The Key consists of 2 bytes except for the special case where length is > 255, in which case it is 4 bytes.
Byte 0 = Field ID: 0->255
Byte 1 = Field length: 0->255 (if 255 then it is followed by a UINT16 for the length)

Unknown Data Fields

The flexible data record allows new field types to be added. Any unknown data fields should be ignored by the data parser. This can be done without disruption to the data stream as the length of the unknown data field is contained in its Key length.

Field Lengths as Versioning

A number of the data fields are fixed length fields as they contain a fixed size structure. The developer should not assume the field length from the field ID as the field length for fixed size structures could be used in future for versioning, provided that the existing layout is maintained and any new data is added to the end of the structure.

FIELD IDs

FID = 0: GPS Data

Length = 21

Offset	Data Type	Length	Description	Unit
0	UINT32	4	GPS UTC date time	Seconds since 1 Jan 2013
4	INT32	4	Latitude	Degrees * 1E7
8	INT32	4	Longitude	Degrees * 1E7
12	INT16	2	Altitude	Metres
14	UINT16	2	2D ground speed	Cm/s
16	BYTE	1	Speed accuracy estimate	Cm/s / 10
17	BYTE	1	2D heading	Deg / 2
18	BYTE	1	PDOP	X 10
19	BYTE	1	Position accuracy estimate	Metres
20	BYTE	1	GPS Status Flags b0=fix VALID, b1=3D fix, b2= old fix, due to loss of signal (b2 applies to Remora, Oyster and Yabby)	

Note that the GPS UTC datetime is recorded here, in addition to the RTC datetime recorded in the record header. The RTC datetime from the header should be used as the greater record time. The GPS datetime indicates how old the GPS data is as some devices will use cached GPS data under certain circumstances. On the Remora, if cached (old) GPS data is being used, b2 of the Status Flags will be set.

FID = 1: Debug Event

Length = N + 2

Offset	Data Type	Length	Description	Unit
0.0	BYTE: 2	0.2	Severity	0 = Info 1 = Warning 2 = Severe 3 = Critical
0.2	BYTE: 5	0.5	Module ID	
1	BYTE	1	Event code	
2	ASCII	N	Ascii debug string	

Note: this field is normally filtered out and saved by the OEM Server. It will be received if the device is setup to send data directly to a third party, effectively bypassing OEM.

The following event codes have been defined:

Event Code	Module Id	
0	Any	General Debug Message
200	General (0)	Modem Firmware Version
201	General (0)	Iridium IMEI
202	General (0)	Bluetooth MAC
203	General (0)	WiFi MAC

FID = 2: Digital Data

Length = 8

Offset	Data Type	Length	Description	Unit
0	UINT32	4	Digital Inputs 0-31 b0 = ignition	
4	UINT16	2	Digital Outputs 0-15	
6	UINT16	2	Device Status Flags b0-b7: common across devices b0 = trip status. 1 = "in trip" b1 = internal battery good b2 = external power good b3 = connected to GSM b4 = shunting power from battery b5 = external power enabled b6 = tamper alert b7 = recovery mode active b8-b15: device specific	

FID = 3: Driver / Operator ID

Length = n + 1

This field is used to identify the driver or operator by capturing an ID.

The Driver ID type is used to identify the source and format of the data.

Offset	Data Type	Length	Description	Unit
0	BYTE	1	Driver ID type / flags	
1	BYTE	N	Driver ID data	

Current types:

Type	Description	Format
0	Reserved	

1	Digital Matter RFID tag reader	5 byte HEX identifier
2	iButton (1-wire) tag	6 byte HEX identifier iButton uses a 6 byte unique identifier
3	4 digit PIN	4 ASCII chars
4	5 digit PIN	5 ASCII chars
5	Username	ASCII chars, NULL terminated
6	Username + password	ASCII chars, NULL separator and NULL terminator
7	Wiegand ID	First byte is number of bits, followed by the raw binary data. Bit 0 of data starts at offset 1.7, bit 1 is at offset 1.6, and so on.

FID = 4: SDI-12 Device Identification

Length = N + 1

Offset	Data Type	Length	Description	Unit
0	BYTE	1	Device Address (SDI12 single char address)	
1	BYTE	N	SDI12 Identification string (typically 30 ASCII characters)	

FID = 5: SDI-12 Measurement

Length = 1 + N*4

The SDI12 spec allows for a device to support 10 different types of measurements (0-9).

Offset	Data Type	Length	Description	Unit
0	BYTE	1	SDI12 Measurement Type (0-9)	
1 + N*4	INT32	4	Measurement (scaled by 1000) <n data values follow>	Scaled by 1000 Eg milli-degrees centigrade

FID = 6: INT16 Analogue Data

Length = N*3

N analogue values in an array made up of the structure below. n is the n'th analogue struct in the array, starting at n = 0, up to a total of N – 1 structures.

Offset	Data Type	Length	Description	Unit
n*3	BYTE	1	Analogue Number	
1+ n*3	INT16	2	Value	

The analogues below (1-4) are common across the devices, Other analogues may vary between devices.

Analogue Number	Meaning	Unit
1	Internal battery voltage	mV
2	External voltage	mV x 10
3	Internal temperature	degrees C x 100
4	GSM signal strength	dBm (0-31 with 31 being full strength, 99 being 'unknown')

Additionally, some battery powered devices also report the below values.

Analogue Number	Meaning	Unit
5	Loaded battery voltage	mV

6	Remaining Battery %	% * 10

FID = 7: INT32 Analogue Data

Length = N*5

N analogue values in an array made up of the structure below. n is the n'th analogue struct in the array, starting at n = 0, up to a total of N – 1 structures.

Offset	Data Type	Length	Description	Unit
N*5	BYTE	1	Analogue Number	
1+ N*5	INT32	4	Value	

FID = 8: BLOB notification (deprecated)

New integrations can ignore this field

Length = 27

Offset	Data Type	Length	Description	Unit
0	UINT32	4	Device Serial Number	
4	BYTE	1	Slot ID	
5	UINT32	4	BLOB ID	
9	UINT16	2	Data Type – MIME type	
11	UINT32	4	BLOB meta data 1	
15	UINT32	4	BLOB meta data 2	
19	UINT32	4	BLOB meta data 3	
23	UINT32	4	BLOB meta data 4	

Currently supported MIME types:

Code	Type
0	application/octet-stream
1	image/jpeg
2	image/png
3	image/gif
4	image/tiff
5	image/bmp
6	application/json
7	application/xml
8	text/plain
9	text/csv
10	text/rtf
11	video/avi
12	video/mpeg
13	video/mp4
14	video/webm

Example of a photograph from the AgriCan peripheral:

Device Serial Number	Serial number of the AgriCan peripheral
Slot ID	3 = camera 0; 4 = camera 1
BLOB ID	Time stamp of photo in seconds
Data Type – MIME type	1 = image/jpeg
BLOB meta data 1	Camera Number: 0 = Camera 0 1 = Camera 1
BLOB meta data 2	Camera Resolution: 1= 160×128 2 = 320×240

	3 = 640×480
	4 = 1280×1024
BLOB meta data 3	Camera quality:
	0 – 100; where 100 is best quality and
	largest image
BLOB meta data 4	Reserved

FID = 9: Device 3rd Party Async Message

Length = N
This field is not commonly used and can be ignored for most integrations.

This field is used to store a message from device / peripherals where the format is unknown to the telematics device and the OEM server. It is simply passed up to the server system that knows how to interpret the data in the "Data" field.

Offset	Data Type	Length	Description	Unit
0	BYTE[n]	N	Data	

The data can be saved in any format shared between the source and the target server, as it is not interpreted by the telematics device or the OEM server.

FID = 10: Project Code

Length = N
This field is not commonly used and can be ignored for most integrations.

ASCII project code

FID = 11: Trip Type Code

Length = N
This field is not commonly used and can be ignored for most integrations.

ASCII trip type code

FID = 12: Console Data

Length = N
This field is not commonly used and can be ignored for most integrations.

This field is used to store data coming from the Digital Matter console.
The data is a Digital Matter Binary Data Stream – see "Digital Matter BDS" document.
The following BDS data values are defined in the namespace of the Time and Attendance Data Field:

Data ID	Length	Description
0	1	Event Code Enum:
		1 – Employee Log On
		2 – Employee Log Off
		3 – Log On Machine
		4 – Log Off Machine
		5 – Change Machine Logon
		(3, 4, 5 – no longer used)

1	N	Project Code in ASCII
2	N	Trip Type Code in ASCII
3	1	Fit for Work? Boolean 1/0
4	N	Employee Driver ID (1 byte type + tag data)
5	N	Supervisor Driver ID (1 byte type + tag data) – only if supervisor override
6	N	Data – generic ASCII text field

FID = 13: RF Tag Data (Deprecated)

New integrations can ignore this field

Length = 23 + N*6

Reports raw data from a tag or asset.

Offset	Data Type	Length	Field	Description
0	UINT32	4	Gateway serial	The serial of the receiving gateway.
4	UINT32	4	Serial number	The serial of the tag.
8	UINT32	4	Token	Shows asset in Trailer mode. Otherwise may be null.
12.0	BYTE : 2	0.2	Gateway mode	0 = Trailer 1 = Taglist 2, 3 = Reserved
12.2	BYTE : 2	0.2	Link type	0 = Broadcast 1 = Static 2= Dynamic 3 = Reserved
12.4	BOOL	0.1	Gained tag	Set when tag/asset comes into range/is selected.
12.5	BOOL	0.1	RSSI delta	Set when RSSI changes significantly (Taglist mode).
12.6	BOOL	0.1	Please report	Set when tag requests a report.
12.7	BOOL	0.1	Debounce failed	Set when digital IO's are reported oscillating.
13	BYTE	1	Reserved	
14	BYTE	1	Tag type	0 = Mini 1 = T50 2 = Tiny Other = reserved
15.0	BYTE : 5	0.5	Firmware version	
15.5	BYTE : 3	0.3	Hardware revision	
16	INT8	1	RSSI	In dBm.
17	INT8	1	Tx power	In dBm.
18.0	BYTE : 7	0.7	Report period	Tag report period.
18.7	BOOL	0.1	Period in minutes?	Indicates period in minutes / seconds.
19	BYTE	1	Retry count	How many times was Id message retried?
20	BYTE	1	Battery voltage	Units 3.3 / 256 V.
21.0	BYTE : 4	0.4	Digital levels	Logical digital levels
21.4	BYTE : 4	0.4	Digital changes	Which levels changed?
22	BYTE	1	Sensor count N	How many sensor ID/Values follow
23	Sensors_t[N]	N*6	Sensors	Caters for N sensors
+ 0	BYTE	1	Id	Sensor id, or 0xff for null.
+ 1.0	BOOL	0.1	Low alarm	Value below alarm threshold
+ 1.1	BOOL	0.1	High alarm	Value above alarm threshold
+ 1.2	BYTE:6	0.6	Reserved	
+ 2	INT32	4	Value	Sensor value, or INT32_MAX for null.

FID = 14: RF Tag Lost (Deprecated)

New integrations can ignore this field

Length = 16

Reports loss of a tag or asset

Offset	Data Type	Length	Field	Description
0	UINT32	4	Gateway serial	The serial of the receiving gateway.
4	UINT32	4	Serial number	Null in Trailer mode.
8	UINT32	4	Token	Shows asset in Trailer mode. Otherwise may be null.
12.0	BYTE : 2	0.2	Gateway mode	0 = Trailer 1 = Taglist 2, 3 = Reserved
12.2	BYTE : 2	0.2	Link type	0 = Broadcast 1 = Static 2= Dynamic 3 = Reserved
12.4	BYTE : 4	0.4	Reserved	
13	BYTE	1	Tag type	0 = Mini 1 = T50 2 = Tiny Other = reserved
14.0	UINT16: 15	1.7	Last seen	Time since last seen, in seconds or minutes.
15.7	BOOL	0.1	Last seen in mins?	Indicates previous field is in minutes.

FID = 15: Device Trip Type and Data

Length = 3

Offset	Data Type	Length	Description	Unit
0	BYTE	1	**Device Trip Type** This is the reason that the trip was started by the device. 0 = NONE 1 = Ignition 2 = Movement 3 = Run Detect 4 and up = reserved	
1	UINT16	2	**Movement trip trimming amount** Valid only for Device Trip Type = 2 Indicates the number of seconds that should be trimmed off the movement trip	seconds

Implementation detail:

Logged as a field on the Digital Input change when the ignition is turned off on a movement trip.

FID = 16: Garmin FMI Stop Response

Length = 5

This field is not commonly used and can be ignored for most integrations.

Offset	Data Type	Length	Description
0	UINT32	4	Message ID

4	BYTE	1	Message Response: 0 = Reserved, 1 = Accept, 2 = Decline

FID = 17: Accident Data
Length = 29

High detail accident data upload field. Applies to wired devices (Dart, G100, G62, etc)

Offset	Data Type	Length	Description	Unit
0	UINT32	4	Accident ID – UTC date time	Seconds since 1 Jan 2013
4	UINT32	4	GPS UTC date time	Seconds since 1 Jan 2013
8	INT32	4	Latitude	Degrees * 1E7
12	INT32	4	Longitude	Degrees * 1E7
16	INT16	2	Altitude	Metres
18	UINT16	2	2D ground speed	Cm/s
20	BYTE	1	Speed accuracy estimate	Cm/s / 10
21	BYTE	1	2D heading	Deg / 2
22	BYTE	1	PDOP	X 10
23	BYTE	1	Position accuracy estimate	Metres
24	BYTE	1	GPS Status Flags b0=fix VALID, b1=3D fix	
25	INT16:10	1.2	the magnitude of the maximum delta-Velocity on the X axis seen recently	hm/h (70 = 7km/h)
26.2	INT16:10	1.2	the magnitude of the maximum delta-Velocity on the Y axis seen recently	hm/h (70 = 7km/h)
27.4	INT16:10	1.2	the magnitude of the maximum delta-Velocity on the Z axis seen recently	hm/h (70 = 7km/h)
28.6	BOOL	0.1	Delta Velocity is orientated as forward, right, down, rather than x, y, z.	
28.7		0.1	Reserved	

FID = 18: Accelerometer Trace Header
Length = 58

Applies to wired devices (Dart, G100, G62, etc)

Accelerometer trace header data, which applies to the samples that follow in FID 19.

Offset	Data Type	Length	Description	Unit
0	UINT32	4	Accident ID – UTC date time	Seconds since 1 Jan 2013
4	INT32[3][3]	36	Matrix that transforms column vector of x/y/z forces to fwd/right/down if oriented. Blank if unoriented.	1.0 == 514326528 [i][j] ordering (row entries contiguous)
40	INT32	4	Filter pole (= A1)	+-1.0 fullscale
44	INT32	4	Filter gain (= B0 = -B1)	+-1.0 fullscale
48	INT16[3]	6	Final input	+-16G fullscale, x/y/z
54	UINT16	2	Trigger point in samples array	
56	UINT16	2	Number of samples in sample array	

FID = 19: Accelerometer Trace Samples
Length = 4 + (N * 6)

Applies to wired devices (Dart, G100, G62, etc)

Accelerometer trace data, at 100Hz. Interpret using the header information in FID 18

Offset	Data Type	Length	Description	Unit
0	UINT32	4	Accident ID – UTC date time	Seconds since 1 Jan 2013
4	INT16[N][3]	N*3*2	Samples, highpass filtered with out[N] = A1*out[N-1] + B0*in[N] + B1*in[N-1]	+-16G fullscale, x/y/z, 100Hz

FID = 20: V5 RF Message

Length = 22 + N

This field is not commonly used and can be ignored for most integrations.

Reports raw radio data from a V5 transmitter.

Offset	Data Type	Length	Field	Description
0	UINT32	4	GPS UTC date time	Seconds since 1 Jan 2013
4	INT32	4	Latitude	Degrees * 1E7
8	INT32	4	Longitude	Degrees * 1E7
12	BYTE	1	2D ground speed	Km/h
13	BYTE	1	Position accuracy estimate	Metres
14	INT8	1	RSSI (incl. antenna factor)	dBm
15	UINT32	4	Source Id	The serial of the transmitter
19.0	BOOL	0.1	Broadcast Flag	Set for broadcasts
19.1	BYTE : 7	0.7	System Id	Valid for broadcasts
20.0	UINT16 : 12	1.4	Message Type	From global message-type namespace
21.4	BYTE : 4	0.4	Reserved	On-air reserved bits, usually zero
22	BYTE[N]	N	Message Payload	Determined by message type

The Message Payload field at the end of the FID is variable length, and is determined by the Message Type field. For instance, message type 0x40 is the Ping Id message, with the following contents:

Offset	Data Type	Length	Field	Description
0	INT8	1	Tx EIRP	Units of dBm, includes antenna factor
1	BYTE	1	Battery	Units of 15 mV (255 is 3.825V)
2.0	BYTE	0.7	Update Period	In seconds or minutes
2.7	BYTE	0.1	Update Period Minutes	Set for Update Period in minutes

Message type 0x50 is the Ping GPS Id message:

Offset	Data Type	Length	Field	Description
0	INT8	1	Tx EIRP	Units of dBm, includes antenna factor
1	BYTE	1	Battery	Units of 15 mV (255 is 3.825V)
2.0	BYTE	0.7	Update Period	In seconds or minutes
2.7	BYTE	0.1	Update Period Minutes	Set for Update Period in minutes
3	UINT32	4	GPS Time	Seconds since 1 Jan 2013
7	INT32	4	Latitude	Degrees * 1E7
11	INT32	4	Longitude	Degrees * 1E7
15.0	BYTE	0.6	Accuracy	Position accuracy, LSb is 2m
15.6	BOOL	0.1	Moved since fix	GPS position is old
15.7	BOOL	0.1	In-trip	Doesn't imply moved since fix

Message type 0x60 is the T50 Id message:

Offset	Data Type	Length	Field	Description
0	INT8	1	Tx EIRP	Units of dBm, includes antenna factor
1	BYTE	1	Battery	Units of 15 mV (255 is 3.825V)
2.0	BYTE	0.7	Update Period	In seconds or minutes
2.7	BYTE	0.1	Update Period Minutes	Set for Update Period in minutes
3	BYTE	1	Sensor 0 Id (Optional)	Ids above 127 have an INT32 value

	INT16/INT32	2/4	Sensor 0 Value (Optional)	Sensor specific value (usually C°/100)
4				
6/8	BYTE	1	Sensor 1 Id (Optional)	Id / Value pairs continue
7/9	INT16/INT32	2/4	…	…

FID = 21: Profiling Counters

Length = N

Reports long term, low frequency counters for performance monitoring and prediction.

This is commonly used on battery powered devices (Remora, Oyster, etc)

Offset	Data Type	Length	Field	Description
0	BYTE	1	Counter Id	Unique across device types
1	INT16/INT32	2/4	Counter Value	32-bit if top bit of Counter Id is set
1 + L_0	BYTE	1	Counter Id	
2 + L_0	INT16/INT32	2/4	Counter Value	
…				

Counter Id's:

Id	Description	Scaling – LSb Equal To
0	Internal Battery Voltage	1 mV
1	Internal Battery	0.01 %
2	Est. Battery Capacity Used	1 mAh
3	Maximum Temperature	0.01 C°
4	Initial Internal Battery Voltage	1 mV
5	Average Successful GPS Fix Time	1 s per fix
6	Average Failed GPS Fix Time	1 s per failed fix
7	Average GPS Freshen Time	1 s per freshen attempt
8	Average Wakeups Per Trip	1 wakeup per trip
9	Initial Battery Capacity Used	1 mAh
128	Successful Uploads	1 upload
129	Successful Upload Time	1 s
130	Failed Uploads	1 upload
131	Failed Upload Time	1 s
132	Successful GPS Fixes	1 fix
133	Successful GPS Fix Time	1 s
134	Failed GPS Fixes	1 fix
135	Failed GPS Fix Time	1 s
136	GPS Freshen Attempts	1 attempt
137	GPS Freshen Time	1 s
138	Accelerometer Wakeups	1 wakeup
139	Trips	1 trip
140	GPS Fixes Due to 'Upload on Jostle'	1 fix
141	Uploads Due to 'Upload on Jostle'	1 upload
142	Uptime	1 s
143	Tx Count	1 tx
144	Rx Count	1 rx
145	Successful Wifi Scans	1
146	Failed Wifi Scans	1
147	Sample Count	1
148	BLE Module Uptime	1 s
149	BLE Module Failures	1
150	BLE Scans	1

FID = 22: Hand-held radio GPS data

Length = N+16

This field is not commonly used and can be ignored for most integrations.

This data field contains information sent from a radio GPS device including a serial number to identify the radio device.

This data field must be present in the record for records of log reason 43 = "Connected Device Data". All fields in this record should pertain to the same connected device.

Offset	Data Type	Length	Description
0	BYTE	1	Source Device Type 1 = ICOM radio
1	BYTE	1	Serial number length in bytes.
2	CHAR[N]	N	Serial number identifying source device. In the case of ICOM radios this is an ASCII string (not null terminated) with a unique alphanumeric prefix + the number of the radio. E.g "ABCDE9999"
N+2	BYTE	1	Log reason of the source data For ICOM radios this will be one of: • Heartbeat • Digital Input Changed
N+3	BYTE	1	Flags b0 = GPS fix valid other bits reserved, set to zero
N+4	INT32	4	Latitude (Degrees * 1E7)
N+8	INT32	4	Longitude (Degrees * 1E7)
N+12	UINT16	2	Speed (cm/s)
N+14	BYTE	1	Heading (deg/2)
N+15	BYTE	1	Digital Inputs b0 = reserved, set to zero b1 = emergency b2 = man down b3 = Using Default GPS Position b4..b7 reserved, set to zero

FID = 23: Deprecated

FID = 24: High-G Event
Length = 6
This field generally applies to battery powered devices (Remora, Oyster, etc)

This data field describes a high-G accelerometer event. It is logged at the time of the event and is usually accompanied by the last known GPS coordinates. GPS coordinates closer in time to the event may or may not be available in subsequent records.

Offset	Data Type	Length	Description	Unit
0	UINT16	2	Peak G force	1024 = 1 G
2	UINT16	2	Average absolute value of G force	1024 = 1 G
4	UINT16	2	Duration	Milliseconds

FID = 25: WiFi Location Scan

Length = N * 8

This field only applies to WiFi enabled devices.

This data field contains the results of a Wifi AP scan by the device.
The number of entries is the field length / 8.
Max entries 30.

Offset	Data Type	Length	Description	Unit
0	BYTE[]	6	MAC address of AP	
6	INT8	1	Signal strength	dBm
7	B0..b3		Channel #	
	B4..b7		Reserved – set to zero	

FID = 26: TRIP Distance, Trip Duration

Length = 8

This field is not commonly implemented on DM Devices. The Bolt and Dart can report this field.
Contact support for more information.

Contains the distance and duration data for the trip – logged on end of trip.
Starts at zero at start of trip.

Offset	Data Type	Length	Description	Unit
0	UINT32	4	Trip distance	Metres
4	UINT32	4	Trip run hours	Seconds

FID = 27: Device Odometer, Run Hours

Length = 8 / 12

This field is not commonly implemented on DM Devices. The Bolt and Dart can report this field.
Contact support for more information.

Contains the latest Odo and Run Hour data from the device.
Set on the device by async message or text message.

Offset	Data Type	Length	Description	Unit
0	UINT32	4	Device Odo (range 40million km, precision 10m)	Metres / 10
4	UINT32	4	Run hours	Seconds
Optional extension				
8	UINT32	4	Secondary run hours	Seconds

FID = 28: Cell Tower Scan

Length = N * 10

This field is not commonly implemented. The WiFi enabled devices report this as a fallback for location. It is not generally supported by other cellular devices. Contact support for more information.

This data field contains the results of a cell tower scan by the device.

The number of entries is the field length / 10.
Max entries 20.

Offset	Data Type	Length	Description	Unit
0	UINT32	4	Cell ID	
4	UINT16	2	Location Area Code	
6	UINT16	2	Mobile Country Code (MCC)	
8	UINT16	2	Mobile Network Code (MNC)	

Bluetooth Tag Types
To be used with FID 29 & 30.

DM Guppy Tag Data
Length = 7 bytes, tag type 0

Offset	Data Type	Length	Description	Unit
0	UINT32	4	Tag Serial Number	
4	INT8	1	Tx Power	0.1 dBm
5	BYTE	1	Battery Voltage	x 50 mV
6	INT8	1	Internal Temperature	°C

Apple iBeacon
Length = 21/27 bytes, tag type 1

Offset	Data Type	Length	Description	Unit
0	BYTE[16]	16	UUID (big endian)	
16	UINT16	2	Major ID	
18	UINT16	2	Minor ID	
20	INT8	1	Calibrated Tx Power	dBm @ 1m*
21	BYTE[6]	6	MAC Address (little endian) **	

*See specifications at https://developer.apple.com/ibeacon/ for information on Tx power calibration method.
** Only sent in certain device configurations and firmware versions

Eddystone
Length = 17/23 bytes, tag type 2

Offset	Data Type	Length	Description	Unit
0	BYTE[10]	10	Namespace ID (big endian)	
10	BYTE[6]	6	Instance ID (big endian)	
16	INT8	1	Tx Power	dBm @ 0m
17	BYTE[6]	6	MAC Address (little endian) *	

* Only sent in certain device configurations and firmware versions

Ingics iBS01 Basic
Length = 9 bytes, tag type 3

Offset	Data Type	Length	Description	Unit
0	BYTE[6]	6	MAC Address (little endian)	
6	UINT16	2	Battery Voltage	x 10 mV

8	BYTE	1	Tag Flags*	bitfield

*See tag specifications at https://www.ingics.com/

Ingics iBS01 Temperature / Humidity
Length = 12 bytes, tag type 4

Offset	Data Type	Length	Description	Unit
0	BYTE[6]	6	MAC Address	
6	UINT16	2	Battery Voltage	x 10 mV
8	BYTE	1	Tag Flags*	bitfield
9	INT16	2	Temperature	0.01 °C
11	BYTE	1	Relative Humidity	%

*See tag specifications at https://www.ingics.com/

DM SensorNode Bluetooth
Length = 20 bytes, tag type 5

Offset	Data Type	Length	Description	Unit
0	UINT32	4	Tag Serial Number	
4	INT8	1	Tx Power	0.1 dBm
5	BYTE	1	Battery Voltage	x 50 mV
6	INT8	1	Internal Temperature	°C
7	INT16	2	Probe 1 Temperature	0.01 °C
9	INT16	2	Probe 2 Temperature	0.01 °C
11	INT16	2	Temp/RH Sensor - Temperature	0.01 °C
13	BYTE	1	Temp/RH Sensor - Humidity	%
14.0	BYTE : 1	0.1	Digital Input 1 State	
14.1	BYTE : 1	0.1	Digital Input 2 State	
14.2	BYTE : 6	0.6	Reserved (set to 0)	
15	UINT16	2	Analog Input 1 Value	mV
17	UINT16	2	Analog Input 2 Value	mV
19	BYTE	1	Reserved (set to 0)	

Eddystone TLM Frame
Length = 19 bytes, tag type 6

Offset	Data Type	Length	Description	Unit
0	BYTE[6]	6	MAC Address (little endian)	
6	BYTE[13]	13	Telemetry frame data *	

* (Excludes Frame Type Byte) See specification at:
https://github.com/google/eddystone/blob/master/eddystone-tlm/tlm-plain.md

Technoton ES7 Fuel Sensor
Length = 21 bytes, tag type 7

Offset	Data Type	Length	Description	Unit

0	BYTE[6]	6	MAC Address (little endian)	
6	UINT32	4	Frequency	0.001Hz
10	BYTE	1	Temperature	°C + 50°C
11	UINT16	2	Lateral Acceleration	0.01m/s^2 + 320m/s^2
13	UINT16	2	Longitudinal Acceleration	0.01m/s^2 + 320m/s^2
15	UINT16	2	Vertical Acceleration	0.01m/s^2 + 320m/s^2
17	UINT32	4	Malfunction Mask*	bitfield

* See specification at: https://www.jv-technoton.com/

Geobox Ble TPMS Sensor

Length = 10 bytes, tag type 8

Offset	Data Type	Length	Description	Unit
0	BYTE	1	Tyre number	
1	BYTE[4]	4	Sensor ID	
5	BYTE	1	Flags*	Bit 0: Alert Bit 1: Status 0 Bit 2: Status 1 Bits 3-5: Wake mode Bit 6: Aerated
6	UINT16	2	Pressure	2.5kPa
8	BYTE	1	Temperature	°C + 50°C
9	BYTE	1	Battery voltage	- Value < 0x3A: Fault - Value = 0xFF: Fault - Else: Voltage (V) = 1.8 + (value-0x3A)*0.01

* See specification at: http://www.cubautoparts.com/

Escort Ble Fuel Sensor

Length = 10 bytes, tag type 9

Offset	Data Type	Length	Description	Unit
0	BYTE[6]	6	MAC Address (little endian)	
6	UINT16	2	Level	Arbitrary unit between 0-1024/4096
8	BYTE	1	Battery Voltage	0.1V
9	BYTE	1	Temperature	°C

Ingics iBS04 Tag

Length = 11 bytes, tag type 10

Offset	Data Type	Length	Description	Unit
0	BYTE[6]	6	MAC Address (little endian)	
6	UINT16	2	Battery Voltage	x 10mV
8	BYTE	1	Flags	Bit 0: Button Bit 1: Moving

				Bit 2: Hall Effect
9	BYTE	1	User Data 0	
10	BYTE	1	User Data 1	

Generic Tag Data

Length = N bytes, tag type 255

Offset	Data Type	Length	Description	Unit
0	UINT16	2	Generic Tag Type	
2	BYTE[6]	6	MAC Address	
8	BYTE	1	Length of Data	
9	BYTE[]	N	Data	

FID = 29: Bluetooth Tag List

Length = N

The full tag list may be split across multiple flexi records as it could be very long. Each individual tag entry is started with a tag head (see below), and then then the tag data (from tag types above). For example, there will be tag header 1, tag data 1, tag header 2, tag data 2, etc… The data length in the tag header matches the tag data length (from above), and does not include the header length.

Offset	Data Type	Length	Description	Unit
0.0	BYTE : 6	0.6	Tag Data Length	
0.6	BYTE : 2	0.2	Tag Log Reason	0 = Update, 1 = Found, 2 = Lost
1	BYTE	1	Tag Type	
2	INT8	1	RSSI	dBm
3	BYTE[]		Tag data (see tag types above)	

Note the Tag Log Reason. The record header (see the beginning of the document) will contain a Log Reason from the Log Reason List. This commonly Log Reason 50 – "Bluetooth Tag Data". Log Reasons 33-35 are not used with Bluetooth scanning.

The Tag Log Reason within the tag list will contain the Update, Found, Lost information.

FID = 30: Bluetooth Tag Individual Data

Length = 16 + N

One tag per field

Offset	Data Type	Length	Description	Unit
0.0	BYTE : 6	0.6	Tag Data Length	
0.6	BYTE : 2	0.2	Tag Log Reason	0 = Update, 1 = Found, 2 = Lost
1	BYTE	1	Tag Type	
2	INT8	1	RSSI	dBm
3	UINT32	4	UTC Datatime	Seconds from 00:00, 1/1/2013
7	INT32	4	GPS Latitude	Degrees * 1_{x10}^{7}
11	INT32	4	GPS Longitude	Degrees * 1_{x10}^{7}
15	BYTE	1	GPS Position Accuracy	Metres
16	BYTE[]		Tag data (see tag types above)	

FID = 31: Image Data

Length = 2 + N

This field holds small images from optical or infrared sensors.

Offset	Data Type	Length	Description	Unit
0	UINT16	2	Sensor Type	
2	BYTE[]	N	Image Data	Sensor specific

MLX90640 Infrared Camera

Length = 1544, Sensor Type 0

Image Data Offset	Data Type	Length	Description	Unit
0	UINT16	2	Warmup time	s
2	UINT16	2	Exposure (1 / Framerate)	1 ms
4	UINT16	2	Emissivity	0.001
6	UINT16	2	Ambient Temperature	[0, 17000] = [-40, 300]° C
8	UINT16[]	2 * 768	Pixels Ordered from left to right, top to bottom.	[0, 17000] = [-40, 300]° C, good pixel [32768, 49768] = [-40, 300]° C, outlier pixel [65535] = bad pixel