This document describes all of the real-time data files generated by MFLL. The field archive contains the 'Processed ASCII' files with extension changed from .csv to .xlsx and a multi-flight Event Log file. Please see Table 2 where the second column (Parent Data File) contains 'Processed Data' for a complete description of the file contents. Note that the user must apply the corresponding Sci Power scalar to Ref 1 and Ref 2 to obtain valid results. For questions, contact Dr. Jeremy Dobler (email: jeremy.dobler@harris.com)

1 A description of data collected by the Multi-functional Fiber Laser Lidar (MFLL) Instrument as flown for ACT-America science data missions in 2016

1.1 MFLL Data Summary

The MFLL instrument provides the data necessary to determine measurements of CO_2 concentration during airborne science missions. The instrument measures atmospheric optical depth at a wavelength that is absorbed by CO_2. Additional data required for the retrieval of CO_2 concentration is also collected by the instrument. These data include altimetry, environmental (temperatures, position/velocity) information, laser wavelengths, and a log of activity that transpires during instrument operation and flight. Post-flight, the CO_2 data can be re-processed at a higher sample rate, producing new versions of some of the in-flight data files, but at the higher sample rate.

1.2 MFLL Data Files and Variables

Table 1 lists the data files produced by MFLL and the variables included in the data files. The following abbreviations are used in filenames and data format descriptions.

1. YYYY = year
2. MM = month
3. DD = day
4. HH = hour
5. mm = minute
6. ss = sec
7. uuu = fractional seconds
8. T = separator character between date and time
9. Z = indicates Zulu, or UTC, time zone
10. <xxx> = variable length descriptive string

Table 1: MFLL Data Files

File Type	File Name	Data Content
GPS File	YYYY-MM-DDTHHmmssZ_GPS_Coordinates.csv	Date Time, Latitude, Longitude, Altitude, Horizontal Velocity, Heading Angle, Vertical Velocity
Temperature File	YYYY-MM-DDTHHmmssZ_Temperatures.csv	Date Time, EDFA TEC Temp, EDFA TEC Output %, Seed TEC Temp, Seed TEC Output %, Optics TEC Temp, Optics TEC Output %, BPF TEC Temp, BPF TEC Output %, BPF, Seed, Ambient (Bay 4), Ambient (Bay 2), PMT, WaveRef, Bristol, PXIe
Wavelength File	YYYY-MM-DDTHHmmssZ_Wavelengths.csv	Date Time, Wavelength
Wavelength Mean File	YYYY-MM-DDTHHmmssZ_Wavelength_Means.csv	Date Time, Mean Wavelength
Altimeter File	YYYY-MM-DDTHHmmssZ_AltPeak.csv	Date Time, Path Length
Configuration File	YYYY-MM-DDTHHmmssZ_DIAL_<xxx>.ini	Base Filename, Tones Filename, # of Tones, # of Sweeps, # of Points/Channel, Center Frequencies, # of A/D Channels, Modulation Sample Rate, A/D Sample Rate, Points/Frame, Sweeps/Frame, Range Offset, Volts/Watt, Modulation Amplitudes
Processed ASCII File	YYYY-MM-DDTHHmmssZ_DIAL_<xxx>.csv	Date Time, Clipping, Sci Power, Ref Power, Ranges, Sci Signals, Ref Signals, Cal Values, Power Scaling Factors, Range Offset
Processed Double File	YYYY-MM-DDTHHmmssZ_DIAL_<xxx>.dbl	Processed data in binary format
TDMS Data File	YYYY-MM-DDTHHmmssZ_DIAL_<xxx>.tdms	Science and Reference data. See 'TDMS File Format Internal Structure' available from Developer Zone - National Instruments for formats
TDMS Index File	YYYY-MM-DDTHHmmssZ_DIAL_<xxx>.tdms_index	Index file for Signals TDMS file. See 'TDMS File Format Internal Structure' available from Developer Zone - National Instruments for formats.
Event Log	YYYY-MM-DDTHHmmssZ_Event_Log.txt	Date Time, List of settings, errors, and significant events

1.3 Sample Data Files

Examples of human-readable data files are given below. Note that all files are in comma-separated values (CSV) format padded with spaces to produce fixed-width columns for improved readability in a text editor.

1. GPS Data File

```
YYYY-MM-DD HH:mm:ss.uuu,        Latitude,       Longitude,    Altitude (m),H Velocity (m/s),   Heading (deg),V Velocity (m/s)
2016-04-07 13:54:17.000,     41.10839820,    -85.01013530,    210.89200000,      0.05000000,      0.00000000,      0.00000000
2016-04-07 13:54:18.000,     41.10839860,    -85.01013490,    210.80500000,      0.01000000,      0.00000000,     -0.08000000
2016-04-07 13:54:19.000,     41.10839910,    -85.01013430,    210.76000000,      0.04123106,     14.03624347,     -0.04000000
```

2. Temperature_Data File

```
YYYY-MM-DD HH:mm:ss.uuu,       EDFA TEC,   EDFA TEC Out%,       Seed TEC,   Seed TEC Out%,      Optics TEC,Optics TEC Out %,        BPF TEC,    BPF TEC Out%,            BPF,          Seed, Ambient (Bay 4), Ambient (Bay 2),            PMT,         WaveRef,         Bristol,            PXIe
2016-04-07 13:54:16.000,          28.01,           -29,         28.05,            12,          36.00,           -24,          36.00,             1,          36.02,          28.62,          24.68,          25.03,          27.82,          25.79,          27.12,          31.24
2016-04-07 13:54:17.000,          28.01,           -29,         28.05,            12,          36.00,           -24,          36.00,             1,          36.02,          28.62,          24.68,          25.05,          27.82,          25.80,          27.12,          31.24
2016-04-07 13:54:18.000,          28.01,           -29,         28.05,            12,          36.00,           -24,          36.00,             1,          36.02,          28.63,          24.71,          25.06,          27.82,          25.79,          27.12,          31.24
```

3. Wavelength Data File

```
YYYY-MM-DD HH:mm:ss.uuu,            DFB1,            DFB2,            DFB3,         WaveRef
2016-04-07 13:54:18.900, 1571.1119143219,                ,                ,
2016-04-07 13:54:20.000, 1571.1118385730,                ,                ,
2016-04-07 13:54:21.200, 1571.1118877634,                ,                ,
2016-04-07 13:54:22.300, 1571.1118645939,                ,                ,
2016-04-07 13:54:23.400, 1571.1118205165,                ,                ,
2016-04-07 13:54:28.700,                , 1571.0619225305,                ,
2016-04-07 13:54:30.800,                , 1571.0619347446,                ,
2016-04-07 13:54:31.900,                , 1571.0619835663,                ,
2016-04-07 13:54:33.100,                , 1571.0619049876,                ,
2016-04-07 13:54:34.200,                , 1571.0619368801,                ,
2016-04-07 13:54:39.600,                ,                , 1571.1618401365,
2016-04-07 13:54:40.800,                ,                , 1571.1618357807,
2016-04-07 13:54:41.900,                ,                , 1571.1618195270,
2016-04-07 13:54:43.000,                ,                , 1571.1618353191,
2016-04-07 13:54:44.200,                ,                , 1571.1618131920,
2016-04-07 13:54:49.500,                ,                ,                , 1571.1502342514
2016-04-07 13:54:50.700,                ,                ,                , 1571.1502580185
2016-04-07 13:54:52.500,                ,                ,                , 1571.1503579493
2016-04-07 13:54:53.600,                ,                ,                , 1571.1502666528
2016-04-07 13:54:54.700,                ,                ,                , 1571.1502764477
2016-04-07 13:55:00.100, 1571.1118124880,                ,                ,
2016-04-07 13:55:01.200, 1571.1118537132,                ,                ,
```

4. Wavelength Mean Data File

```
YYYY-MM-DD HH:mm:ss.uuu,            DFB1,            DFB2,            DFB3,         WaveRef
2016-04-07 13:54:23.400, 1571.1118651537,                ,                ,
2016-04-07 13:54:34.200,                , 1571.0619365418,                ,
2016-04-07 13:54:44.200,                ,                , 1571.1618287910,
2016-04-07 13:54:54.700,                ,                ,                , 1571.1502786640
2016-04-07 13:55:04.500, 1571.1118392619,                ,                ,
2016-04-07 13:55:14.200,                , 1571.0619164289,                ,
2016-04-07 13:55:24.300,                ,                , 1571.1618344121,
2016-04-07 13:55:34.100,                ,                ,                , 1571.1503847195
```

5. Altimeter Data File

```
YYYY-MM-DD HH:mm:ss.uuu,       Range (m)
2016-04-07 13:54:16.000,          680.40
2016-04-07 13:54:16.100,          679.99
2016-04-07 13:54:16.200,          680.42
2016-04-07 13:54:16.400,          679.81
```

6. Configuration File

```
[Collection]
Base Filename = "/E/20160406/2016-04-06T181923Z"

[Provisioned Tones]
Filename = "/C/ASCENDS/Software/Resource/ACES-100MHz.tn"
Number of Channels = 6
Number of Sweeps = 500
Number of Points = 10000000
Center Frequencies = "35040, 35520, 36080, 36560, 37100, 38120"

[Implementation]
Number of Channels = 3
Output Rate = 100000000
Input Rate = 4000000
Points Per Frame = 400000
Sweeps Per Frame = 500
Range Offset = -7.839000
Watts Per Volt = "1.2755E-9, 44.4396"
Modulation Amplitudes = "0.210000, 0.450000, 0.380000"
```

7. Processed Data File

YYYY-MM-DD HH:mm:ss.uuu,	CLIPPING,	SCI POWER (W),	REF POWER (W),	CH 0 RANGE (m),	CH 1 RANGE (m),	CH 2 RANGE (m),	SCI 0,	SCI 1,	SCI 2,	SCI 3,	REF 0,	REF 1,	REF 2,	REF 3
YYYY-MM-DD HH:mm:ss.uuu,	CAL VALUES,	1.000000,	1.000000,	-7.839000,	-7.839000,	-7.839000,	1.000000,	1.000000,	1.000000,	1.000000,	1.000000,	0.997933,	0.988819,	1.000000
2016-04-06 18:19:23.000,	0,	347E-3,	117E-3,	0.74,	0.76,	0.86,	1.350113E-1,	1.025015E-1,	1.098910E-1,	0.000000E+0,	4.526812E-2,	3.446091E-2,	3.728756E-2,	0.000000E+0
2016-04-06 18:19:23.100,	0,	340E-3,	117E-3,	0.79,	0.82,	1.01,	1.321479E-1,	1.003782E-1,	1.075965E-1,	0.000000E+0,	4.527919E-2,	3.446735E-2,	3.728762E-2,	0.000000E+0
2016-04-06 18:19:23.200,	0,	338E-3,	117E-3,	0.72,	0.71,	0.77,	1.311123E-1,	9.971448E-2,	1.069237E-1,	0.000000E+0,	4.527593E-2,	3.446388E-2,	3.728853E-2,	0.000000E+0
2016-04-06 18:19:23.300,	0,	337E-3,	117E-3,	0.80,	0.69,	0.81,	1.309192E-1,	9.948344E-2,	1.066436E-1,	0.000000E+0,	4.528228E-2,	3.445998E-2,	3.729178E-2,	0.000000E+0

8. Event Log

```
2016-04-07 13:53:31.300          Other-> Time reference lock acquired
2016-04-07 13:53:32.900          Other-> PXI locked to Free Running time reference
2016-04-07 13:53:34.000          Lidar-> Calibration coefficients set to 0.99793300, 0.98881900
2016-04-07 13:54:14.500          Altim-> Altimeter started
2016-04-07 13:54:14.500        WaveLen-> Wavelength monitoring started
2016-04-07 13:54:14.500         EnvMon-> Environmental monitoring started
2016-04-07 13:54:14.500        DFBCont-> DFB control & monitoring started
2016-04-07 13:54:14.800         EnvMon-> EDFA TEC set to 28.00 deg C
2016-04-07 13:54:14.800         EnvMon-> EDFA TEC P coefficient set to 200
2016-04-07 13:54:14.800         EnvMon-> EDFA TEC I coefficient set to 30
2016-04-07 13:54:14.800         EnvMon-> EDFA TEC D coefficient set to 100
2016-04-07 13:54:14.800         EnvMon-> EDFA TEC heat power set to 5 %
2016-04-07 13:54:14.900         EnvMon-> Seed TEC set to 28.00 deg C
2016-04-07 13:54:14.900         EnvMon-> Seed TEC P coefficient set to 200
2016-04-07 13:54:14.900         EnvMon-> Seed TEC I coefficient set to 20
2016-04-07 13:54:14.900         EnvMon-> Seed TEC D coefficient set to 100
2016-04-07 13:54:14.900         EnvMon-> Seed TEC heat power set to 100 %
2016-04-07 13:54:15.000         EnvMon-> Optics TEC set to 25.00 deg C
2016-04-07 13:54:15.000         EnvMon-> Optics TEC P coefficient set to 500
2016-04-07 13:54:15.000         EnvMon-> Optics TEC I coefficient set to 100
2016-04-07 13:54:15.000         EnvMon-> Optics TEC D coefficient set to 0
2016-04-07 13:54:15.000         EnvMon-> Optics TEC heat power set to 100 %
2016-04-07 13:54:15.100         EnvMon-> BPF TEC set to 36.00 deg C
2016-04-07 13:54:15.100         EnvMon-> BPF TEC P coefficient set to 35
2016-04-07 13:54:15.100         EnvMon-> BPF TEC I coefficient set to 25
2016-04-07 13:54:15.100         EnvMon-> BPF TEC D coefficient set to 3200
2016-04-07 13:54:15.100         EnvMon-> BPF TEC heat power set to 100 %
2016-04-07 13:54:15.500        DFBCont-> DFB ON Case TEC = 30.00 deg C
2016-04-07 13:54:15.500        DFBCont-> DFB ON Case TEC = 29520 DAC Counts
2016-04-07 13:54:15.500        DFBCont-> DFB ON Internal TEC = 33.54 deg C
2016-04-07 13:54:15.500        DFBCont-> DFB ON Internal TEC = 13284 DAC Counts
2016-04-07 13:54:15.500        DFBCont-> DFB ON Laser Current = 16.00 mA
2016-04-07 13:54:16.200        DFBCont-> DFB OFF2 Case TEC = 30.00 deg C
2016-04-07 13:54:16.200        DFBCont-> DFB OFF2 Case TEC = 29474 DAC Counts
```

```
2016-04-07 13:54:16.200          DFBCont-> DFB OFF2 Internal TEC = 32.49 deg C
2016-04-07 13:54:16.200          DFBCont-> DFB OFF2 Internal TEC = 15610 DAC Counts
2016-04-07 13:54:16.200          DFBCont-> DFB OFF2 Laser Current = 16.25 mA
2016-04-07 13:54:17.000          DFBCont-> DFB OFF1 Case TEC = 30.00 deg C
2016-04-07 13:54:17.000          DFBCont-> DFB OFF1 Case TEC = 29522 DAC Counts
2016-04-07 13:54:17.000          DFBCont-> DFB OFF1 Internal TEC = 33.76 deg C
2016-04-07 13:54:17.000          DFBCont-> DFB OFF1 Internal TEC = 12876 DAC Counts
2016-04-07 13:54:17.000          DFBCont-> DFB OFF1 Laser Current = 16.00 mA
2016-04-07 14:16:06.800            Lidar-> LIDAR system started saving to 2016-04-07T141607Z_DIAL_CAL
2016-04-07 14:25:03.300          DFBCont-> CH1 TEC DAC set to 13283
2016-04-07 14:25:55.000          DFBCont-> CH3 TEC DAC set to 12875
2016-04-07 14:36:07.900            Lidar-> ERROR! - OFF2 Reference signal low: 0.0000 V
2016-04-07 14:36:31.774             User-> The previous error was a test.  I switched off the SOA.
2016-04-07 14:36:36.600            Lidar-> LIDAR system stopped
2016-04-07 15:54:01.700            Lidar-> LIDAR system started without saving
2016-04-07 15:58:37.400            Lidar-> LIDAR system stopped
2016-04-07 15:59:35.000            Altim-> Altimeter stopped
2016-04-07 15:59:36.100           EnvMon-> Environmental monitoring stopped
2016-04-07 15:59:36.200          DFBCont-> DFB control & monitoring stopped
2016-04-07 15:59:39.100          WaveLen-> Wavelength monitoring stopped
```

1.4 Binary Double Data File

A description of the binary double data file is given below.

```
Ref 1 Cal
Ref 2 Cal
Ref 5 Cal
Timestamp
Ref 0
Ref 1
Ref 2
Ref 3
Ref 4
Ref 5
Sci 0
Sci 1
Sci 2
Sci 3
Sci 4
Sci 5
Timestamp
Ref 0
Ref 1
Ref 2
…
Sci 4
Sci 5
```

1.5 Data Variables

A description of the data variables is provided in Table 2. Table 2 data entries contain

1. The name of the variable.
2. The parent file containing the variable.
3. The file format of the file containing the variable.
4. The reporting interval in milliseconds for the variable.
5. The units in which the variable is reported.
6. The minimum value of the variable.
7. The maximum value of the variable.
8. The precision of the variable, as measured and reported.
9. The format of the data.
10. Notes and examples.

Note that all data entries in CSV files except for date time values are zero-padded to achieve the specified data format width. This results in fixed column widths suitable for viewing in a text editor.

NI = National Instruments

Table 2: MFLL Data Description

Table of Recorded Data									
Variable	**Parent Data File**	**File Format**	**Report Interval (msec)**	**Units**	**Minimum**	**Maximum**	**Precision (Measured)**	**Format**	**Notes and Examples**
Date Time	GPS	CSV	1000		0000-00-00 00:00:00.0000	9999-12-31 23:59:59.999	0.001	YYYY-MM-DD HH:mm:ss.uuu	2016-04-07 13:54:16.000 Based on ISO 8601 with modification to make it readable by Excel
Latitude	GPS	CSV	1000	degrees	-90	90	1E-7	%16.8f	41.10839820
Longitude	GPS	CSV	1000	degrees	-180	180	1E-7	%16.8f	-85.01013530
Altitude	GPS	CSV	1000	meters			0.001	%16.8f	210.89200000
H_Velocity	GPS	CSV	1000	meters/sec	0			%16.8f	0.04123106 Calculated from North & East GPS velocity
Heading	GPS	CSV	1000	degrees	0	360		%16.8f	14.03624347 Calculated from North and East GPS velocity
V_Velocity	GPS	CSV	1000	meters/sec			0.01	%16.8f	-0.02000000
Date Time	Temperatures	CSV	1000		0000-00-00 00:00:00.0000	9999-12-31 23:59:59.999	0.001	YYYY-MM-DD HH:mm:ss.uuu	2016-04-07 13:54:16.000 Based on ISO 8601 with modification to make it readable by Excel
EDFA TEC	Temperatures	CSV	1000	°C			0.01	%16.2f	28.01
EDFA TEC Out%	Temperatures	CSV	1000	%	-100	100	1	%16d	-21 Negative = cooling, positive = heating
Seed TEC	Temperatures	CSV	1000	°C			0.01	%16.2f	28.05
Seed TEC Out%	Temperatures	CSV	1000	%	-100	100	1	%16d	-21 Negative = cooling, positive = heating
Optics TEC	Temperatures	CSV	1000	°C			0.01	%16.2f	36.00
Optics TEC Out%	Temperatures	CSV	1000	%	-100	100	1	%16d	-21 Negative = cooling, positive = heating
BPF TEC	Temperatures	CSV	1000	°C			0.01	%16.2f	36.00
BPF TEC Out%	Temperatures	CSV	1000	%	-100	100	1	%16d	-21 Negative = N/A, positive = heating Only a heater with no ability to cool
BPF	Temperatures	CSV	1000	°C			0.01	%16.2f	36.02
Seed	Temperatures	CSV	1000	°C			0.01	%16.2f	28.62
Ambient (Bay 4)	Temperatures	CSV	1000	°C			0.01	%16.2f	26.57
Ambient (Bay 2)	Temperatures	CSV	1000	°C			0.01	%16.2f	27.26
PMT	Temperatures	CSV	1000	°C			0.01	%16.2f	27.82
WaveRef	Temperatures	CSV	1000	°C			0.01	%16.2f	25.79

Bristol	Temperatures	CSV	1000	°C			0.01	%16.2f	27.12
PXIe	Temperatures	CSV	1000	°C			0.01	%16.2f	31.24
Date Time	Wavelengths	CSV	1000		0000-00-00 00:00:00.0000	9999-12-31 23:59:59.999	0.001	YYYY-MM-DD HH:mm:ss.uuu	2016-04-07 13:54:16.000 Based on ISO 8601 with modification to make it readable by Excel
DFB1	Wavelengths	CSV	1000, ~35000	nanometers	0		1E-10	%16.10f	1571.1119143219 N samples read at 1 sec intervals, then ~35 sec before next reading
DFB2	Wavelengths	CSV	1000, ~35000	nanometers	0		1E-10	%16.10f	1571.0619225305 N samples read at 1 sec intervals, then ~35 sec before next reading
DFB3	Wavelengths	CSV	1000, ~35000	nanometers	0		1E-10	%16.10f	1571.1618401365 N samples read at 1 sec intervals, then ~35 sec before next reading
WaveRef	Wavelengths	CSV	1000, ~35000	nanometers	0		1E-10	%16.10f	1571.1502342514 N samples read at 1 sec intervals, then ~35 sec before next reading
Date Time	Wavelength_Means	CSV	~10000		0000-00-00 00:00:00.0000	9999-12-31 23:59:59.999	0.001	YYYY-MM-DD HH:mm:ss.uuu	2016-04-07 13:54:16.000 Based on ISO 8601 with modification to make it readable by Excel
DFB1	Wavelength_Means	CSV	~10000	nanometers	0		1E-10	%16.10f	1571.1119143219 Calculated mean of N samples read at 1 sec interval
DFB2	Wavelength_Means	CSV	~10000	nanometers	0		1E-10	%16.10f	1571.0619225305 Calculated mean of N samples read at 1 sec interval
DFB3	Wavelength_Means	CSV	~10000	nanometers	0		1E-10	%16.10f	1571.1618401365 Calculated mean of N samples read at 1 sec interval
WaveRef	Wavelength_Means	CSV	~10000	nanometers	0		1E-10	%16.10f	1571.1502342514 Calculated mean of N samples read at 1 sec interval
Date Time	AltPeak	CSV	100		0000-00-00 00:00:00.0000	9999-12-31 23:59:59.999	0.001	YYYY-MM-DD HH:mm:ss.uuu	2016-04-07 13:54:16.300 Based on ISO 8601 with modification to make it readable by Excel
Range	AltPeak	CSV	100	meters				%16.2f	680.42 Determined by fitting PN altimeter correlation peak
Date Time	Event_Log	Tab-Delim Text	Event-Driven		0000-00-00 00:00:00.0000	9999-12-31 23:59:59.999	0.001	YYYY-MM-DD HH:mm:ss.uuu	2016-04-07 13:54:16.000 Based on ISO 8601 with modification to make it readable by Excel
Subsystem	Event_Log	Tab-Delim	Event-Driven					%8s	Altim, EnvMon, DFBCont, WaveLen, Lidar, Other, User

		Text							Specifies subsystem of event origination
Event Description	Event_Log	Tab-Delim Text	Event-Driven					string	"Altimeter started" "EDFA TEC P coefficient set to 200" "ERROR! - SCI ADC clipping"
Date Time	Processed Data	CSV	100		0000-00-00 00:00:00.0000	9999-12-31 23:59:59.999	0.001	YYYY-MM-DD HH:mm:ss.uuu	2016-04-07 13:54:16.300 Based on ISO 8601 with modification to make it readable by Excel
Sci Power Scaler	Processed Data	CSV	100	Watts/Volt	0	1		%16.3e	5.10E-9 Sci Power values were multiplied by this scaler before being written to this file
Ref Power Scaler	Processed Data	CSV	100	Watts/Volt	0	1		%16.3e	5.10E-9 Ref Power values were multiplied by this scaler before being written to this file
Range Offset	Processed Data	CSV	100	meters				%16.3f	-7.839 Range values had this value added to them before being written to this file
Calibration Values	Processed Data	CSV	100		0			%16.6f	0.997933 Multiply signal data by cal value at top of column to get calibrated signals
Clipping	Processed Data	CSV	100	logical	0 = No Clip	1 = Clip		%16d	0
Sci Power	Processed Data	CSV	100	Watts	0			%^16_3e	347E-9
Ref Power	Processed Data	CSV	100	Watts	0			%^16_3e	117E-6
Ch 0 Range	Processed Data	CSV	100	meters				%16.2f	680.42 Determined by fitting CO_2 correlation peak on channel 0
Ch 1 Range	Processed Data	CSV	100	meters				%16.2f	680.42 Determined by fitting CO_2 correlation peak on channel 1
Ch 2 Range	Processed Data	CSV	100	meters				%16.2f	680.42 Determined by fitting CO_2 correlation peak on channel 2
Sci 0	Processed Data	CSV	100	Volts	0	2		%16e	1.350113E-1 Peak-to-peak signal amplitude
Sci 1	Processed Data	CSV	100	Volts	0	2		%16e	1.025015E-1 Peak-to-peak signal amplitude
Sci 2	Processed Data	CSV	100	Volts	0	2		%16e	1.098910E-1 Peak-to-peak signal amplitude
Sci 3	Processed Data	CSV	100	Volts	0	2		%16e	0.000000E+0 Peak-to-peak signal amplitude
Ref 0	Processed Data	CSV	100	Volts	0	2		%16e	4.526812E-2 Peak-to-peak signal amplitude
Ref 1	Processed Data	CSV	100	Volts	0	2		%16e	3.446091E-2 Peak-to-peak signal amplitude

Ref 2	Processed Data	CSV	100	Volts	0	2		%16e	3.728756E-2 Peak-to-peak signal amplitude
Ref 3	Processed Data	CSV	100	Volts	0	2		%16e	0.000000E+0 Peak-to-peak signal amplitude
Ref 1 Cal	Processed Double	Binary	100		0			NI DBL	Multiply Ref 1 data values by this value to calibrate
Ref 2 Cal	Processed Double	Binary	100		0			NI DBL	Multiply Ref 2 data values by this value to calibrate
Ref 5 Cal	Processed Double	Binary	100		0			NI DBL	Multiply Ref 5 data values by this value to calibrate
Timestamp	Processed Double	Binary	100					NI Serial Timestamp	http://www.ni.com/tutorial/7900/en/
Ref N	Processed Double	Binary	100	Volts	0	2		NI DBL	N is channel #, 0-5
Sci N	Processed Double	Binary	100	Volts	0	2		NI DBL	N is channel #, 0-5
Science Signal	TDMS	TDMS	0.00025	ADC Counts	-2^15	2^15		NI Int16	Raw sampled science signal
Reference Signal	TDMS	TDMS	0.00025	ADC Counts	-2^15	2^15		NI Int16	Raw sampled reference signal