



## Estudio geofísico de vibración para la ampliación de la Línea 3 del Metrobús

Benito Juárez, Ciudad de México, México

Informe preparado para:



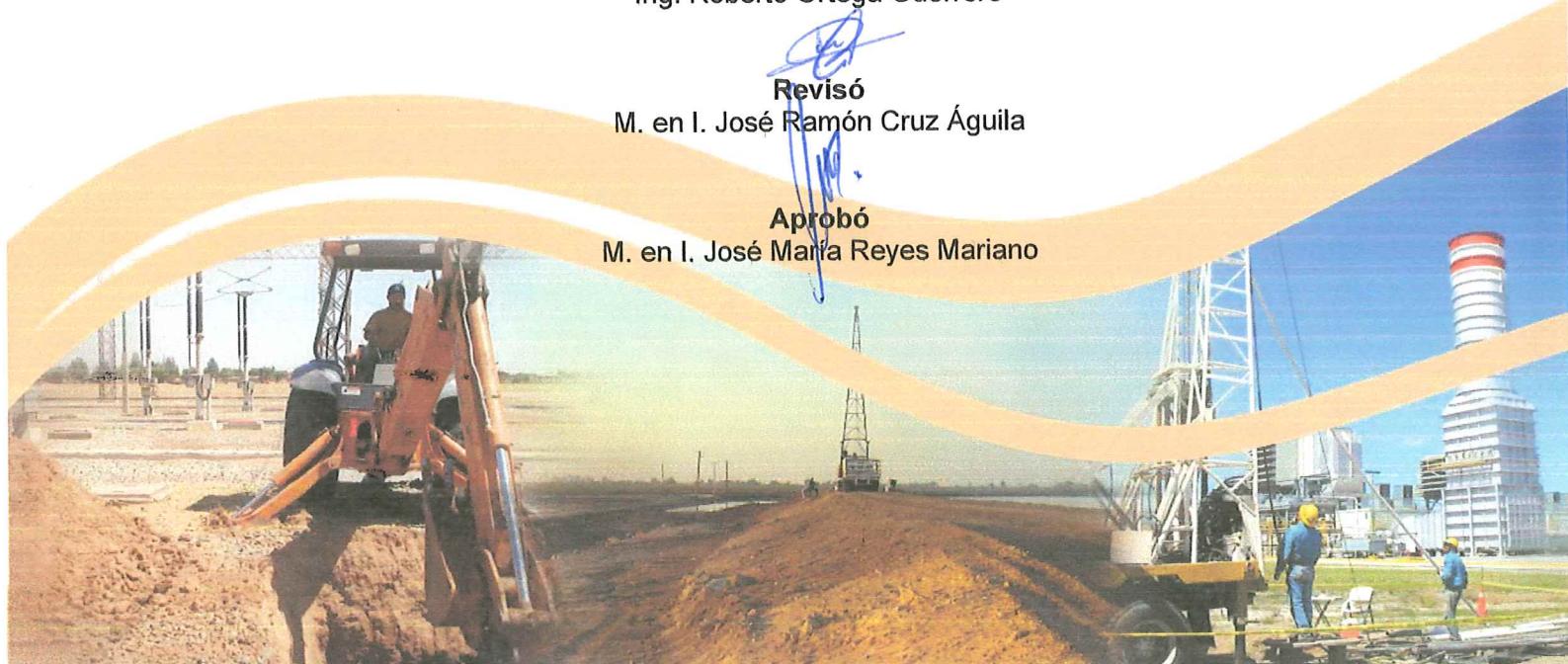
**Informe Final  
EGV-CCMT-19-04-07**

**Noviembre de 2019**

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## RESUMEN EJECUTIVO

Con el objetivo central de conocer la magnitud de las vibraciones que genera el paso del Metrobús en las construcciones aledañas a la zona de ampliación de la Línea 3 del metrobús (Eje 1 Poniente Cuauhtémoc, de Avenida Xola a Bruno Traven) CEMEX México solicitó a DICIMSA ejecutar el estudio geofísico de vibración en la zona de ampliación.

Los trabajos consistieron en el registro de vibración inducida por el paso del camión del Metrobús en 30 puntos distribuidos a lo largo del trazo de ampliación, colocando dos instrumentos de medición, uno en cada lado de la acera con el objeto de conocer la influencia en los extremos de la calle. Las aceras se denominaron LO (Lado Oriente) para el extremo Oriente y LP (Lado Poniente) para el extremo Poniente de la Avenida.

Tomando en cuenta la configuración de carriles por la que se prevé que circulará el metrobús, se consideraron dos escenarios para la toma de lecturas, de forma que se obtuvieron 10 registros de vibración:

- El primero considera el registro de vibración inducida en ambos lados de la acera, cuando el camión del Metrobús circula por el cuarto carril de Poniente a Oriente (T1.- Trayectoria 1).
- El segundo considera el registro de vibración inducida en ambos lado de la acera, cuando el camión del Metrobús, circula por el quinto carril de Poniente a Oriente (T2.- Trayectoria 2).

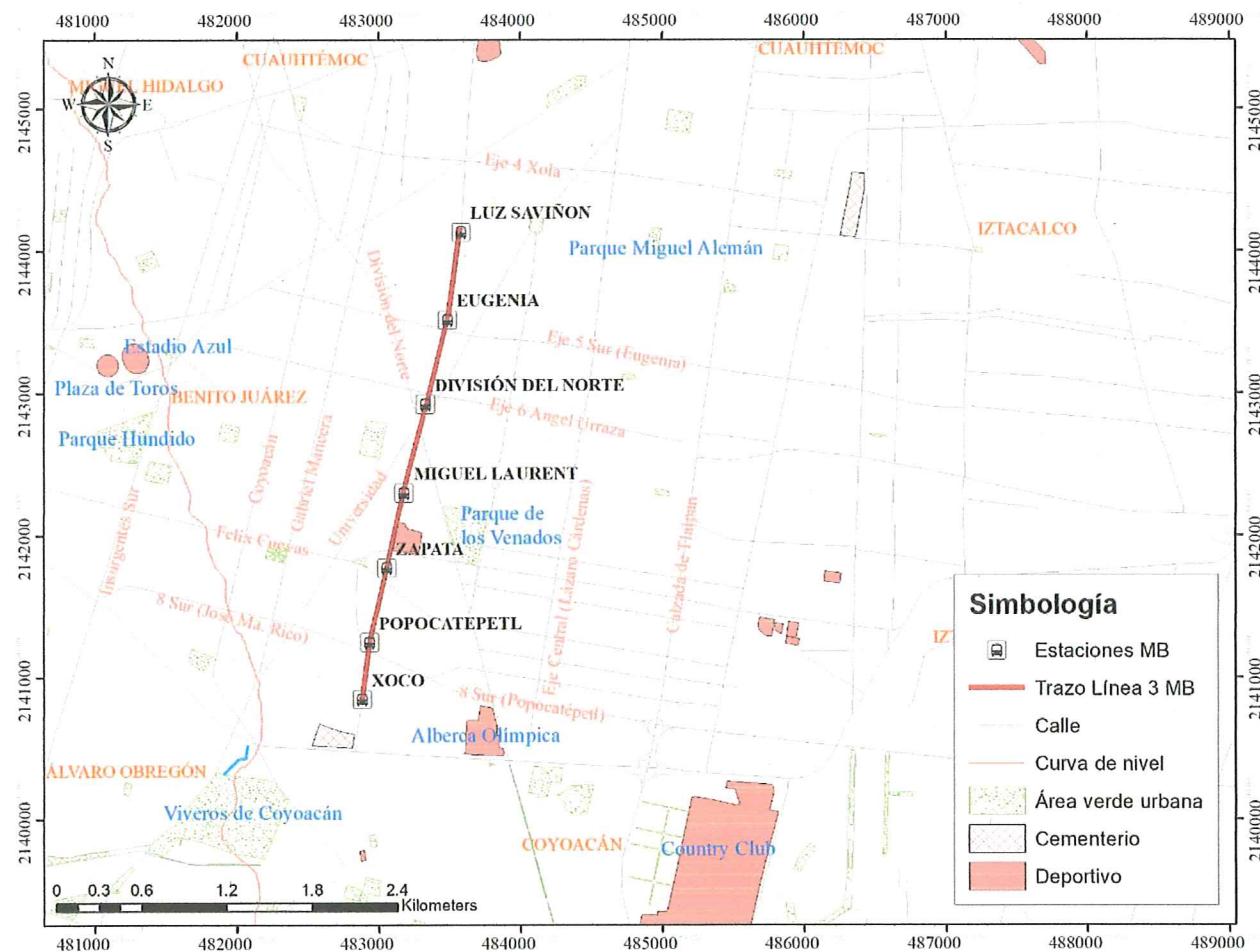
Los resultados de los 120 registros se muestran en la Tabla 2.1, se obtuvieron velocidades máximas de partícula (PPV) de entre 0.0852 mm/s y 0.984 mm/s, correspondiendo el valor más alto al Sitio 8 LO T1 (Lado Oriente, en la Trayectoria 1, cuarto carril) y se debe al paso de Metrobús, tráfico vehicular y el paso de un tráiler. Las frecuencias dominantes para las ondas inducidas por el paso del camión del Metrobús y demás tráfico vehicular, es de entre 7.2 y 7.7 Hz.

En ninguno de los casos registrados el valor máximo de velocidad (PPV) sobrepasa 1 mm/s por lo que de acuerdo a las normas de referencia, las ondas inducidas por el paso del Metrobús y demás tráfico vehicular, no generan vibraciones que puedan causar daño a las construcciones aledañas, solamente en los Sitios 3 LO T2, Sitios 13 LO T2 y Sitios 16 LO T2, se registraron valores máximo de velocidad (PPV) de 0.698, 0.603 y 0.524 mm/s respectivamente, por lo que en estos lugares personas sensibles pueden estar en el umbral de percepción de las ondas inducidas por el paso del Metrobús y demás tráfico vehicular, al ser valores mayores a 0.5 mm/s.

## 1 INTRODUCCIÓN

### 1.1 Antecedentes

CEMEX México (CEMEX), a través de su departamento de Abasto, solicitó a DICIMSA ejecutar el estudio geofísico de vibración para la Ampliación de la Línea 3 del Metrobús. Esta ampliación tendrá una longitud de 4.27 kilómetros, correrá a lo largo del Eje 1 poniente (Av. Cuauhtémoc y Av. México-Coyoacán), desde Av. Xola hasta la calle de Bruno Traven, en la alcaldía Benito Juárez. Asimismo, el proyecto de ampliación contará con seis estaciones y una terminal a la altura del hospital General Xoco. La ubicación del sitio en estudio, en el contexto cartográfico proporcionado por el INEGI (2018), se presenta en la Figura 1.1.



## 1.2 Objetivo y alcances

El objetivo central del presente estudio es el conocer la magnitud de las vibraciones que genera el paso del Metrobús en las construcciones aledañas al Eje 1 Poniente Cuauhtémoc, de Avenida Xola a Bruno Traven, en ambas aceras. Para cumplir con estos objetivos se plantearon los alcances siguientes:

- Conocer la vibración inducida por el paso del camión del metrobús y tránsito normal en la zona de construcciones localizadas sobre la margen de la vialidad, dando prioridad a edificios de vivienda, hospitales y escuelas.
- En cada lectura, colocar dos instrumentos de medición, uno en cada lado de la acera con el objeto de conocer la influencia en los dos extremos de la calle.
- El tipo de cargas vivas o móviles, fuente para el estudio, fueron tanto el Metrobús como el tránsito vehicular manifestado durante el día en la zona. Para ello, se cargó una unidad de metrobús con elementos debidamente distribuidos en toda su área, para simular la carga máxima de operación, así como la velocidad máxima de tránsito permitida.
- De la fuente de tráfico normal de la vialidad, se tomaron lecturas en los equipos, cuando pasaron vehículos de carga o góndolas.
- Se contemplaron dos escenarios de las cargas descritas anteriormente, y de ellas se tomaron las lecturas correspondientes en los puntos críticos: a) Lecturas con el tránsito normal de la zona sin metrobús y b) Lecturas con el tránsito normal de la zona con metrobús, ya sea con su velocidad crucero o frenado, este último aspecto se hizo en las estaciones o semáforos.

## 1.3 Generalidades del Estudio de Vibración

El movimiento vibratorio simple se puede entender como la excitación dinámica de un sistema elástico, como el suelo o una estructura, que da como resultado el movimiento de las partículas que componen el sistema elástico.

Al describir la vibración en el suelo y en las estructuras, el movimiento de una partícula (es decir, un punto en o sobre el suelo o estructura) se utilizan los conceptos de desplazamiento de partículas, velocidad y aceleración y se utilizan para describir cómo responde el suelo o la estructura a la excitación.

Aunque el desplazamiento es generalmente más fácil de entender que la velocidad o la aceleración, rara vez se usa para describir vibraciones transmitidas por el suelo y la estructura

porque la mayoría los transductores utilizados para medir la vibración miden directamente la velocidad o aceleración, no desplazamiento. En consecuencia, el movimiento vibratorio es comúnmente descrito al identificar la velocidad máxima de partículas (PPV) o pico de aceleración de partículas (PPA). Esta es la amplitud de cero a pico.

La velocidad máxima de partículas (PPV) es generalmente aceptado como el descriptor más apropiado para evaluar el potencial de daños a la construcción. Para la respuesta humana, sin embargo, una amplitud de vibración promedio es más apropiada porque toma tiempo para que el cuerpo humano responda a la excitación (en el humano el cuerpo responde a una amplitud de vibración promedio, no a una amplitud máxima).

El desplazamiento generalmente se mide en milímetros (mm), la velocidad se mide en milímetros por segundo (mm/s) y la aceleración se mide en milímetros por segundo al cuadrado ( $\text{mm/s}^2$ ), o relativo a la aceleración de la gravedad (g) ( $9.81 \text{ m/s}^2$ ). 

Si la frecuencia y amplitud de desplazamiento, las amplitudes de la velocidad o aceleración se conocen, las restantes se pueden determinar mediante diferenciación o integración.

La velocidad (V) de la masa se puede determinar tomando el tiempo derivada del desplazamiento, que es equivalente a multiplicar el desplazamiento por  $2\pi f$ : 

$$V = 2\pi f * D$$

La aceleración (A) de la masa se puede determinar tomando la segunda derivada del desplazamiento respecto al tiempo, o la derivada de la velocidad con respecto al tiempo: 

$$A = 2\pi f * V = 2(2\pi f) * D$$

### 1.3.1 Parámetros de Referencia

Como referencia para evaluar los resultados del Estudio de Vibración, se tienen estudios donde se dan Indicadores de los umbrales de percepción humana ante vibraciones armónicas verticales cuando las personas están de pie (Pretlove, Rainer, 1995), tabla 1.1.

**Tabla 1.1. Indicadores de los umbrales de percepción humana ante vibraciones armónicas verticales (Pretlove, Rainer, 1995)**

Descripción	Aceleración pico (mm/s <sup>2</sup> ) para el intervalo de frecuencias de 1 a 10 Hz	Velocidad pico (mm/s) para el intervalo de frecuencias de 10 a 100 Hz
Apenas perceptible	34	0.5
Claramente perceptible	100	1.3
Perturbador / Desagradable	550	6.8
Intolerable	1800	13.8

Atendiendo a la frecuencia de las vibraciones se tiene que:

DE MUY BAJA FRECUENCIA  
<1Hz



Movimiento oscilatorio lento o balanceo en:

- Trenes
- Barcos
- Plataformas flotantes
- Aviones, etc.

DE BAJA FRECUENCIA  
1-20 Hz



Vibraciones producidas por:

- Carretillas elevadoras
- Excavadoras
- Maquinaria y vehículos de obras públicas
- Vehículos de transporte urbano
- Tractores
- Cosechadoras
- Otras maquinarias agrícolas

DE ALTA FRECUENCIA  
20-1.000 Hz

Máquinas neumáticas y rotatorias:

- Martillos picadores neumáticos
- Moledoras
- Pulidoras
- Lijadoras
- Motosierras
- Cortadoras

### 1.3.2 Normas internacionales

En México no se tiene una norma que regule los límites de velocidad de vibración por tráfico vehicular. Existen diferentes estándares internacionales de vibración del suelo principalmente aplicado a voladuras, que establecen diferentes límites de velocidad de vibración para diferentes entornos de vibración y diversos tipos de edificios. Por lo tanto, una elección juiciosa y razonada de qué estándar aplicar en una situación dada es fundamental para el uso adecuado y el beneficio de ese estándar.

#### 1.3.2.1 Norma Española UNE 22-381-93

La Norma UNE 22-381 es la norma que controla todo lo que tiene que ver con la utilización de explosivos en España, esta norma presenta una clasificación de las estructuras:

- Grupo I: Edificios y naves industriales
- Grupo II: Edificios de viviendas, oficinas, centros comerciales y de recreación, edificios de estructuras de valor arqueológico, arquitectónico o histórico que por su fortaleza no representan sensibilidad a vibraciones sísmicas.
- Grupo III: Estructuras de valor arqueológico, arquitectónico o histórico que si presentan debilidad contra vibraciones sísmicas.

La norma española estudia la frecuencia entre los espacios comprendidos; entre 2 y 15 Hertz, luego entre 15 y 75 Hertz y las que pasen los 75 Hertz, también muestra el tipo de edificio o estructura que se verá afectado por este.

En la Tabla 1.2, se puede observar los valores máximos para la seguridad en función del tipo de estructura que se vea afectada por las vibraciones, por lo que se entiende que la vibración no podrá exceder la velocidad que se indica en la tabla siguiente.

Tabla 1.2. Española UNE 22-381-93

FRECUENCIA	2 a 15 Hz	15 a 75 Hz	Mayor a 75 Hz
PARÁMETRO	Velocidad (mm/s)	Desplazamiento (mm)	Velocidad (mm/s)
TIPO DE ESTRUCTURA			
I.- Edificios y naves industriales	20	0.212	100
II.- Edificios de viviendas, oficinas, centros comerciales y de recreación, edificios de estructuras de valor arqueológico, arquitectónico o histórico que por su fortaleza no representan sensibilidad a vibraciones sísmicas.	9	0.095	45
III.- Estructuras de valor arqueológico, arquitectónico o histórico que si presentan debilidad contra vibraciones sísmicas	4	0.042	20

### 1.3.2.2 Norma Alemana DIN 4150

La norma alemana tuvo mucha repercusión en el territorio europeo ya que esta norma sirvió de guía para la realización de otras normas en Europa. La norma DIN 4150 (Tabla 1.3) tiene una subdivisión muy parecida a la norma UNE 22-381 en lo que respecta a la clasificación de los tipos de estructuras que se pueden ver afectados, y obviamente también analiza rangos de frecuencias para diferentes velocidades. Esta norma tiene 3 clases de estructuras, las cuales son:

- Edificios resistentes a vibraciones
- Viviendas
- Construcciones históricas sensibles a vibraciones

Tabla 1.3. Alemana DIN 4150

FRECUENCIA	0 a 10 Hz	10 a 50 Hz	50 a 100 Hz
PARÁMETRO	Velocidad (mm/s)	Velocidad (mm/s)	Velocidad (mm/s)
<b>TIPO DE ESTRUCTURA</b>			
I.- Edificios resistentes a vibraciones	20	20 a 40	40 a 50
II.- Viviendas	5	5 a 15	15 a 20
III.- Construcciones históricas sensibles a vibraciones	3	3 a 8	8 a 10

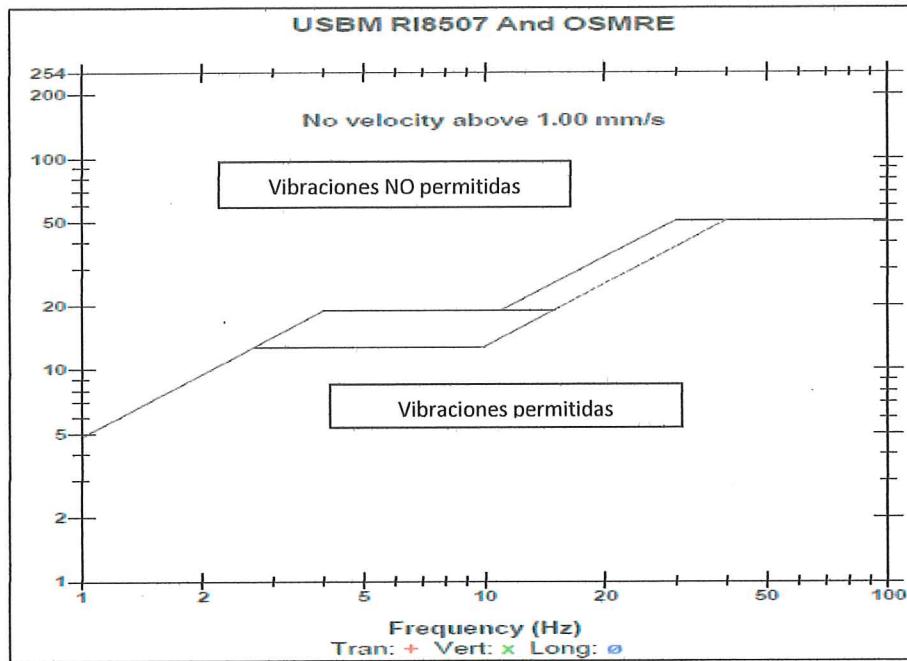
### 1.3.2.3 Norma Estados Unidos USBM RI8507

La norma resume los datos velocidad de una forma en que dependiendo de la velocidad de partícula esta asocia un tipo de daño, en esta norma, todas las frecuencias menores a 40 Hz en esta normativa son consideradas bajas y todas las que sean mayores a 50 Hz son consideradas altas, en Estados Unidos la normativa funciona muy diferente al estándar Europeo.

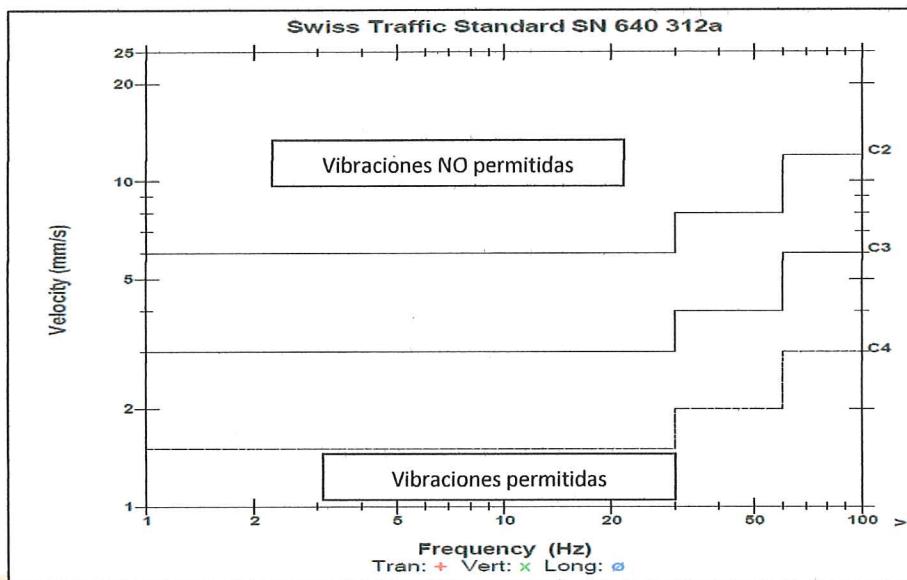
Tabla 1.4. Norma Estados Unidos USBM RL8507

FRECUENCIA	Bajas	Altas
PARÁMETRO	Velocidad (mm/s)	Velocidad (mm/s)
<b>TIPO DE ESTRUCTURA</b>		
I.- Estructuras modernas resistentes	19	50
II.- Estructuras antiguas no resistentes	12.5	50

Los límites estándar de vibración del suelo generalmente se representan gráficamente de manera similar al estándar de voladura de la Oficina de Minería de Superficie de EE. UU. (OSMRE) y las normas de estudio de voladura USBM RI 8507, usando escalas logarítmicas o no lineales en ambas direcciones horizontal y vertical. La intensidad de la vibración (velocidad máxima de partículas) está en la escala vertical y la frecuencia de vibración está en la escala horizontal. Las vibraciones consideradas "permitidas" en estas normas caen por debajo de los límites indicados por las líneas centrales; Las vibraciones "no permitidas" se encuentran por encima de las líneas. Al trazar los estándares linealmente (es decir, con intervalos iguales entre las unidades en las escalas) cambiará la forma de la línea divisoria que separa las vibraciones "permitidas" de las "no permitidas" dramáticamente, pero no cambiará los estándares por sí mismas.



**Figura 1.2. Representación gráfica de la norma USBM RI 8507**



**Figura 1.3. Representación gráfica de la norma para las máquinas y el tráfico, Norma Suiza (SN 640 312a)**

No existe un nivel preciso en el que el daño comienza a ocurrir. El nivel de daño depende del tipo, condición y antigüedad de la estructura, el tipo de terreno sobre el cual se construye la estructura, la duración de la vibración y la frecuencia de la vibración. Los niveles de vibración aceptables establecidos en los estándares de vibración se basan en análisis estadísticos de las probabilidades de daño.

#### 1.3.2.4 Normatividad Suiza

Otro conjunto de estándares de vibración del suelo que se cita ampliamente en todo el mundo son los "estándares suizos" (SN 640 312a). En realidad, hay tres "estándares suizos" separados: uno para la voladura, uno más riguroso para la conducción de pilotes y uno aún más riguroso para las máquinas y el tráfico. El último de ellos es el más aplicable a la construcción y uso de carreteras, así como a la mayoría de las otras formas de construcción.

## 2 TRABAJOS DE EXPLORACION GEOFÍSICA

### 2.1 Registro de vibración (RV)

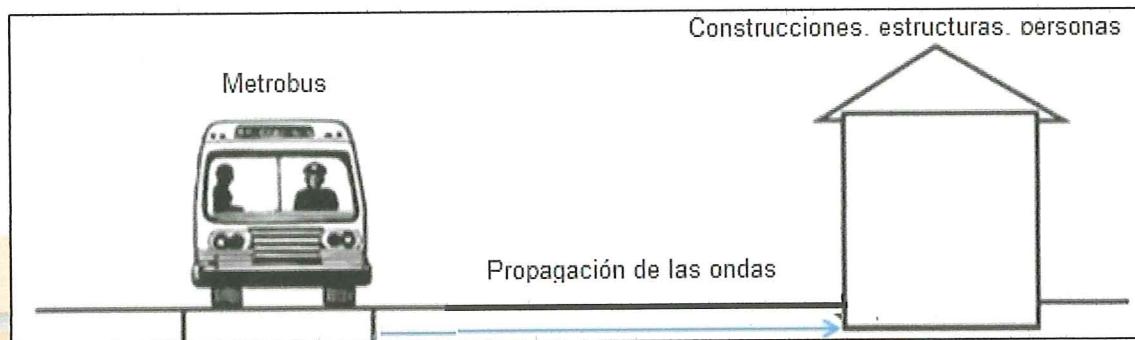
Se realizó el registro de vibración inducida por el paso del camión del Metrobús, en 30 puntos colocando dos instrumentos de medición, uno en cada lado de la acera con el objeto de conocer la influencia en los dos extremos de la calle. Las aceras se denominaron LO (Lado Oriente) para el extremo Oriente y LP (Lado Poniente) para el extremo Poniente de la Avenida.

Tomando en cuenta la configuración de carriles por la que se prevé que circulará el metrobús, se consideraron dos escenarios para la toma de lecturas:

- El primero considera el registro de vibración inducida en ambos lados de la acera, cuando el camión del Metrobús circula por el cuarto carril de Poniente a Oriente (T1.- Trayectoria 1).
- El segundo considera el registro de vibración inducida en ambos lado de la acera, cuando el camión del Metrobús, circula por el quinto carril de Poniente a Oriente (T2.- Trayectoria 2).

De tal forma que se obtuvieron 120 registros de vibración.

Para los registros se utilizó un camión de Metrobús articulado, de 18 m de longitud, con un peso neto de 30 Toneladas. Los sitios ubicados en el Lado Oriente se encuentran a aproximadamente a 15.5 m de la trayectoria T1 y a 12 m de la trayectoria T2. Mientras que los sitios ubicados en el Lado Poniente se encuentran a aproximadamente a 20 m de la trayectoria T1 y a 23.5 m de la trayectoria T2.



**Figura 2.1. Ilustración de la propagación de vibraciones terrestres inducida por el paso del camión del Metrobús hacia edificios y estructuras.**

El levantamiento Geofísico de Registro de Vibración (RV), consistió en la realización de un monitoreo de ondas inducidas por el paso del camión del Metrobús y demás tráfico vehicular, mediante el uso de dos sensores triaxial de banda ancha (CD a 200 Hz) capaz de registrar las amplificaciones inducidas en términos de velocidad de partícula (sismómetro) y aceleración de partícula (acelerómetro), en función del tiempo. Se usó una ventana de tiempo de 20 segundos para el sismómetro y de 5 a 40 min, para el acelerómetro a partir de lo cual se obtiene la aceleración máxima producida por el tráfico vehicular.

Se destaca que el sismómetro y el acelerómetro está constituido por tres sensores, los cuales fueron orientados para registrar la historia de velocidad y aceleración en las componentes longitudinal, transversal y vertical. La orientación de los sensores se relaciona con las siguientes referencias:

- Componente Y (N) del Sensor : Dirección Norte Sur
- Componente X (E) del Sensor : Dirección Este Oeste
- Componente Z (Z) del Sensor: Dirección Vertical

## 2.2 Equipo empleado

El equipo utilizado para realizar el monitoreo de las vibraciones, junto con sus principales características, son los siguientes:

- |                                      |   |
|--------------------------------------|---|
| • Acelerómetro:                      | Marca Kinematics modelo ETNA 2  |
| • Rango dinámico:                    | 155 dB +  |
| • Resolución:                        | 24 bits   |
| • Componentes:                       | Acelerómetros de equilibrio de fuerza triaxiales EpiSensor, orientados ortogonalmente, internos |
| •                                    | Incorporado   |
| • GPS:                               | Incorporado   |
| • Ancho de banda:                    | De CD a 200 Hz  |
| • Rango de escala completa:          | Selezionable por el usuario a $\pm 1g$ , $\pm 2g$ o $\pm 4g$                                    |
| • Frecuencias de muestreo primarias: | 1, 10, 20, 50, 100, 200, 250, 500 sps   |
| • Sismómetro:                        | Marca Instantel modelo Minimate   |
| • Frecuencias de muestreo primarias: | 1, 10, 20, 50, 100, 200, 250, 500 sps   |

El instrumento de monitoreo empleado para este proyecto es de los más modernos y mejores en su tipo, cuentan además con el software requerido para transferir los registros medidos en campo a una computadora capaz de cuantificar los parámetros de la dinámica de la partícula: desplazamiento, velocidad, aceleración y frecuencia del pulso dominante en cada una de sus

tres componentes, además del amortiguamiento, velocidad de partícula pico y espectros de potencia.

Para este estudio, los registros recolectados fueron estudiados para determinar su espectro de potencia a cada uno de los tres canales grabados de cada evento. Del análisis de estos resultados se determinó directamente la frecuencia del pulso dominante ( $f$ ) y los valores máximos asociados a la aceleración (en g), la velocidad (en mm/s) y el desplazamiento (en mm) de cada componente. Realizando de 10 a 40 min de registro en cada sitio.

Se destaca que los instrumentos fueron calibrados para iniciar las lecturas a partir del momento de su activación. Con ello se recopilaron familias de registros en cada punto con mayor calidad.

A partir del análisis de estos Registros de Vibración, se determinaron los parámetros de aceleración, velocidad y desplazamiento de los niveles de vibración generados por la vibración del tráfico vehicular.

## 2.3 Resultados

Por lo general, los niveles máximos de vibración en la dirección longitudinal y transversal son inferiores en comparación con los niveles verticales registrados en condiciones similares, por lo que no son considerados significantes. En consecuencia, solo las amplitudes de vibración pico en la dirección vertical se consideró para el análisis.

Generalmente los niveles más altos de vibración son producidos por los vehículos más pesados, también existe una tendencia de que la vibración generada por el vehículo aumenta con el aumento en las velocidades de conducción.

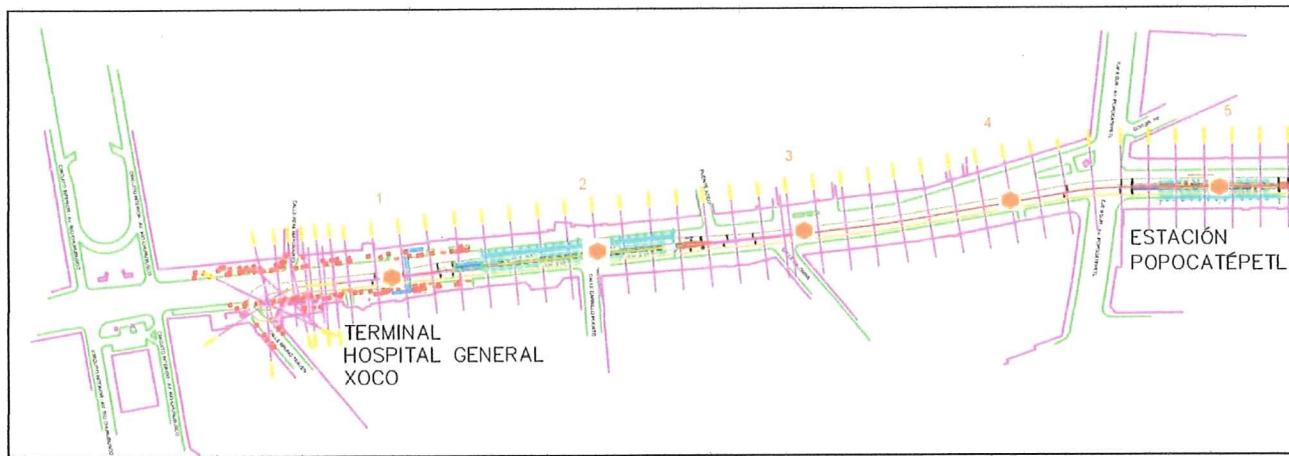
Los resultados de los 120 registros se muestran en la Tabla 2.1, se obtuvieron velocidades máximas de partícula (PPV) de entre 0.0852 mm/s y 0.984 mm/s, correspondiendo el valor más alto al Sitio 8 LO T1 (Lado Oriente, en la Trayectoria 1, cuarto carril) y se debe al paso de Metrobús, tráfico vehicular y el paso de un tráiler.

Las frecuencias dominantes para las ondas inducidas por el paso del camión del Metrobús y demás tráfico vehicular, es de entre 7.2 y 7.7 Hz.

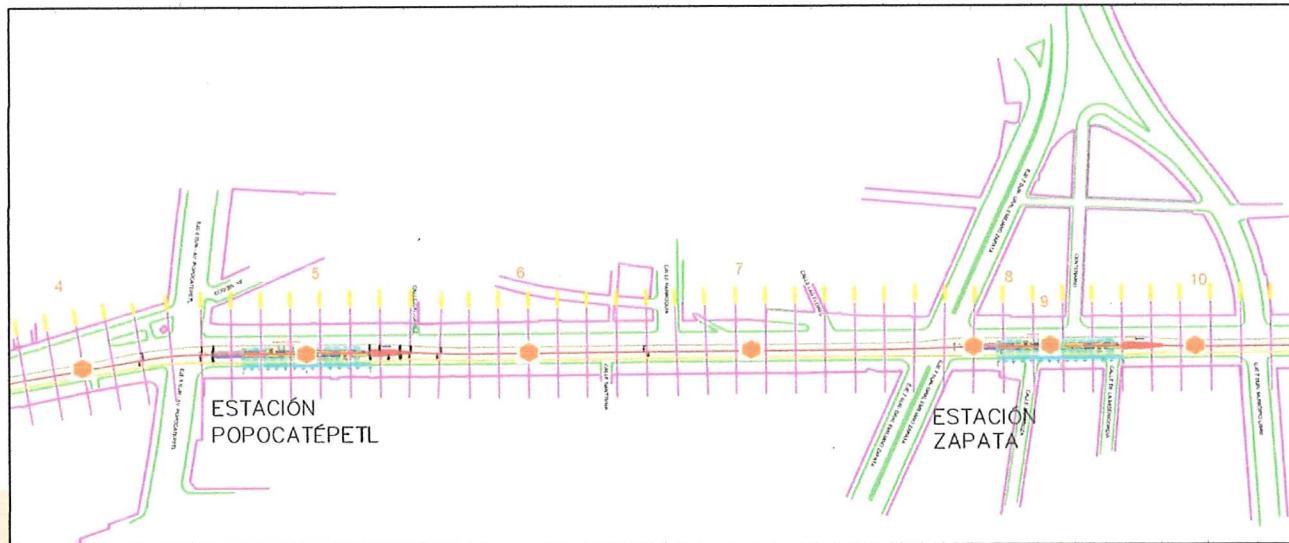
En ninguno de los casos registrados el valor máximo de velocidad (PPV) sobrepasa 1 mm/s por lo que de acuerdo a las normas de referencia, las ondas inducidas por el paso del Metrobús y demás tráfico vehicular, no genera vibraciones que puedan causar daño a las construcciones aledañas.

En los Sitios 3 LO T2, Sitios 13 LO T2 y Sitios 16 LO T2, se registraron valores máximo de velocidad (PPV) de 0.698, 0.603 y 0.524 mm/s respectivamente, por lo que en estos lugares personas sensibles pueden estar en el umbral de percepción de las ondas inducidas por el paso del Metrobús y demás tráfico vehicular, al ser valores mayores a 0.5 mm/s.

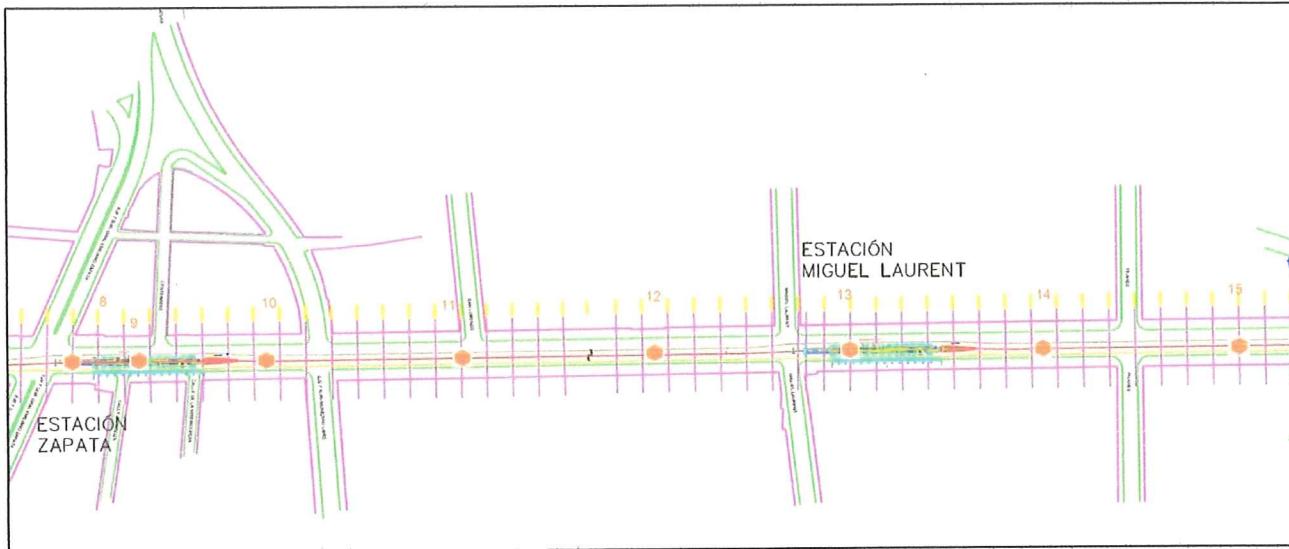
Además de la Figura 2.2 a la Figura 2.6, se muestra la ubicación de los puntos de registro de vibración donde se realizaron las pruebas de vibración.



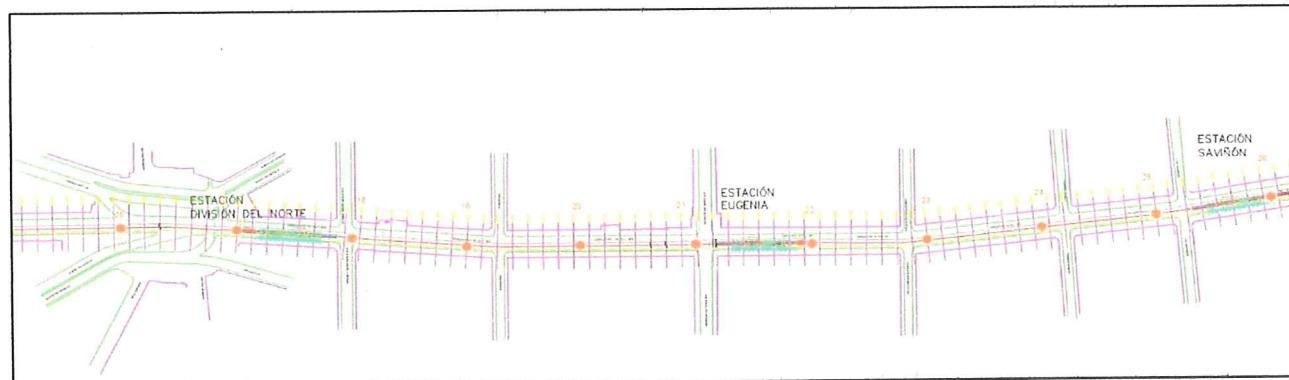
**Figura 2.2. Ubicación de los puntos de registro de vibración (RV) 1 a 5**



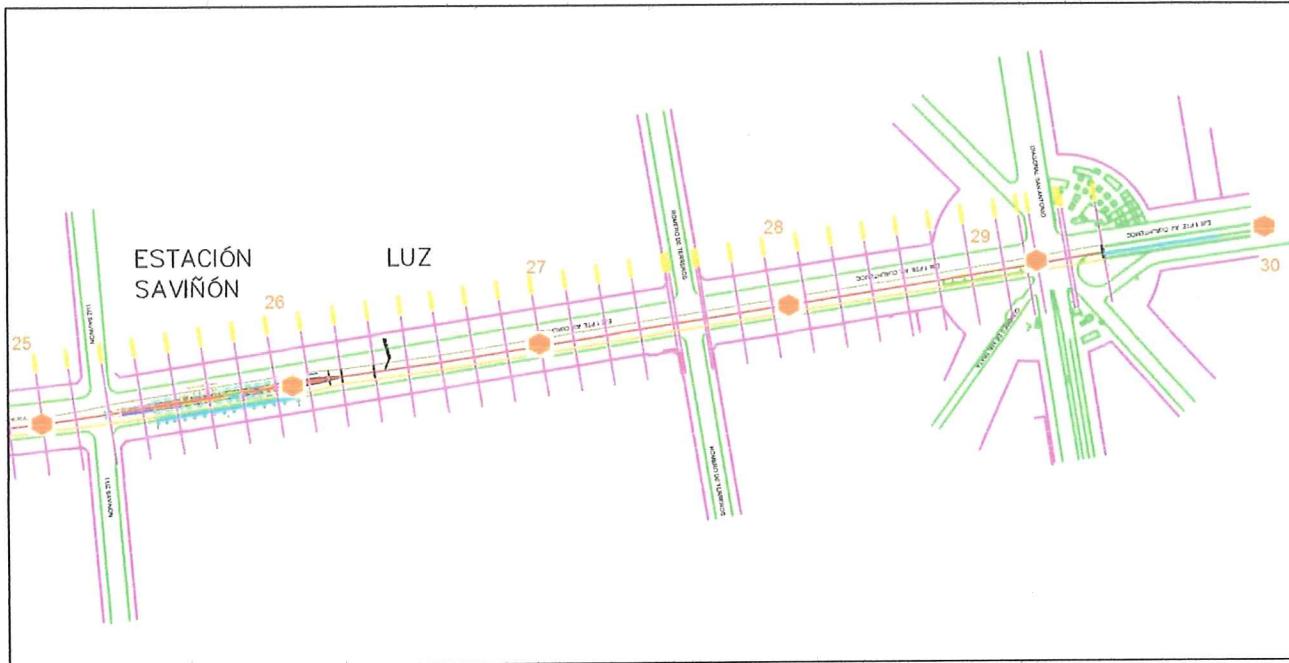
**Figura 2.3. Ubicación de los puntos de registro de vibración (RV) 4 a 10**



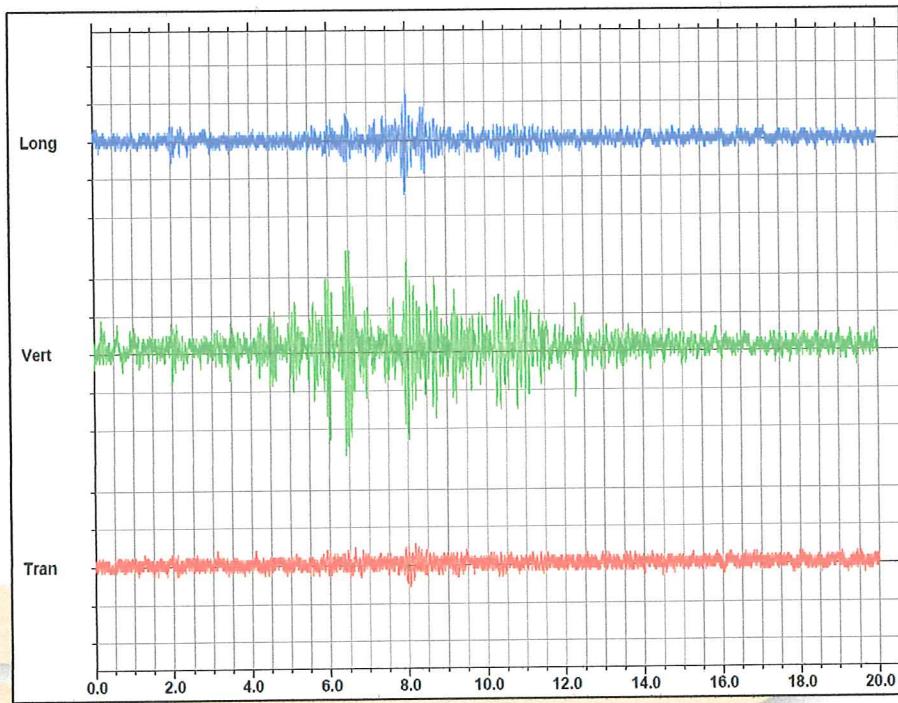
**Figura 2.4. Ubicación de los puntos de registro de vibración (RV) 8 a 15**



**Figura 2.5. Ubicación de los puntos de registro de vibración (RV) 16 a 26**



**Figura 2.6. Ubicación de los puntos de registro de vibración (RV) 25 a 30**



**Figura 2.7. Ejemplo de registro obtenido con el sismómetro (Velocidad de partícula en la escala vertical en mm/s y tiempo en segundos para la escala horizontal)**

**Tabla 2.1. Resultados de Velocidad Máxima de Partícula (PPV) y Frecuencia, para cada uno de los 120 eventos registrados**

LOCALIDAD	PARÁMETRO	Dirección transversal	Dirección vertical	Dirección Longitudinal	Velocidad de la unidad (Km/h)
Sitio 1 LO T1	PPV (mm/s)	0.127	0.317	0.159	35
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 1 LO T2	PPV (mm/s)	0.0794	0.127	0.0635	35
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 1 LP T1	PPV (mm/s)	0.0794	0.206	0.127	35
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 1 LP T2	PPV (mm/s)	0.0794	0.0952	0.0952	35
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 2 LO T1	PPV (mm/s)	0.111	0.302	0.143	40
	Frequency (Hz)	7.8	7.6	7.8	
Sitio 2 LO T2	PPV (mm/s)	0.0952	0.254	0.143	30
	Frequency (Hz)	7.8	7.6	7.8	
Sitio 2 LP T1	PPV (mm/s)	0.0952	0.27	0.0952	40
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 2 LP T2	PPV (mm/s)	0.0794	0.206	0.127	30
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 3 LO T1	PPV (mm/s)	0.0794	0.429	0.254	50
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 3 LO T2	PPV (mm/s)	0.111	0.698	0.286	50
	Frequency (Hz)	7.8	7.6	7.8	
Sitio 3 LP T1	PPV (mm/s)	0.0952	0.302	0.175	50
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 3 LP T2	PPV (mm/s)	0.0794	0.238	0.111	50
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 4 LO T1	PPV (mm/s)	0.127	0.429	0.317	35
	Frequency (Hz)	7.8	7.6	7.8	
Sitio 4 LO T2	PPV (mm/s)	0.127	0.429	0.222	35
	Frequency (Hz)	7.7	7.6	7.7	
Sitio 4 LP T1	PPV (mm/s)	0.0635	0.143	0	35
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 4 LP T2	PPV (mm/s)	0.0794	0.111	0.111	35
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 5 LO T1	PPV (mm/s)	0.0794	0.238	0.111	30
	Frequency (Hz)	7.8	7.6	7.8	
Sitio 5 LO T2	PPV (mm/s)	0.0794	0.206	0.111	30
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 5 LP T1	PPV (mm/s)	0.0635	0.0952	0.0952	30

LOCALIDAD	PARÁMETRO	Dirección transversal	Dirección vertical	Dirección Longitudinal	Velocidad de la unidad (Km/h)
Sitio 5 LP T2	Frequency (Hz)	7.3	7.4	7.4	30
	PPV (mm/s)	0.0952	0.222	0.127	
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 6 LO T1	PPV (mm/s)	0.0952	0.19	0.0635	45
	Frequency (Hz)	7.8	7.5	7.7	
Sitio 6 LO T2	PPV (mm/s)	0.0794	0.206	0.0952	49
	Frequency (Hz)	7.8	7.6	7.7	
Sitio 6 LP T1	PPV (mm/s)	0.0952	0.206	0.111	45
	Frequency (Hz)	7.2	7.4	7.4	
Sitio 6 LP T2	PPV (mm/s)	0.0952	0.175	0.127	49
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 7 LO T1	PPV (mm/s)	0.0794	0.286	0.0952	45
	Frequency (Hz)	7.8	7.6	7.7	
Sitio 7 LO T2	PPV (mm/s)	0.0952	0.286	0.0952	42
	Frequency (Hz)	7.8	7.6	7.7	
Sitio 7 LP T1	PPV (mm/s)	0.0952	0.204	0.11	45
	Frequency (Hz)	7.3	7.5	7.5	
Sitio 7 LP T2	PPV (mm/s)	0.0952	0.206	0.111	42
	Frequency (Hz)	7.3	7.5	7.5	
Sitio 8 LO T1	PPV (mm/s)	0.222	0.984	0.238	42
	Frequency (Hz)	7.8	7.6	7.7	
Sitio 8 LO T2	PPV (mm/s)	0.159	0.413	0.127	30
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 8 LP T1	PPV (mm/s)	0.0952	0.206	0.111	42
	Frequency (Hz)	7.3	7.5	7.5	
Sitio 8 LP T2	PPV (mm/s)	0.0952	0.27	0.111	30
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 9 LO T1	PPV (mm/s)	0.111	0.365	0.19	39
	Frequency (Hz)	7.8	7.6	7.8	
Sitio 9 LO T2	PPV (mm/s)	0.0794	0.254	0.127	32
	Frequency (Hz)	7.8	7.6	7.8	
Sitio 9 LP T1	PPV (mm/s)	0.0952	0.27	0.19	39
	Frequency (Hz)	7.3	7.5	7.5	
Sitio 9 LP T2	PPV (mm/s)	0.0794	0.206	0.127	32
	Frequency (Hz)	7.2	7.4	7.4	
Sitio 10 LO T1	PPV (mm/s)	0.0794	0.143	0.0635	18
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 10 LO T2	PPV (mm/s)	0.0952	0.238	0.143	35
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 10 LP T1	PPV (mm/s)	0.0635	0.127	0.0952	18 .

LOCALIDAD	PARÁMETRO	Dirección transversal	Dirección vertical	Dirección Longitudinal	Velocidad de la unidad (Km/h)
Sitio 10 LP T2	Frequency (Hz)	7.3	7.4	7.5	35
	PPV (mm/s)	0.0794	0.206	0.111	
	Frequency (Hz)	7.4	7.4	7.4	
Sitio 11 LO T1	PPV (mm/s)	0.0794	0.238	0.143	44
	Frequency (Hz)	7.7	7.6	7.7	
Sitio 11 LO T2	PPV (mm/s)	0.0794	0.286	0.238	40
	Frequency (Hz)	7.7	7.6	7.7	
Sitio 11 LP T1	PPV (mm/s)	0.0952	0.333	0.111	44
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 11 LP T2	PPV (mm/s)	0.0952	0.397	0.111	40
	Frequency (Hz)	7.3	7.4	7.5	
Sitio 12 LO T1	PPV (mm/s)	0.0794	0.143	0.111	25
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 12 LO T2	PPV (mm/s)	0.0794	0.238	0.159	40
	Frequency (Hz)	7.8	7.6	7.7	
Sitio 12 LP T1	PPV (mm/s)	0.0635	0.111	0.0952	25
	Frequency (Hz)	7.2	7.4	7.4	
Sitio 12 LP T2	PPV (mm/s)	0.0794	0.111	0.0952	40
	Frequency (Hz)	7.2	7.4	7.4	
Sitio 13 LO T1	PPV (mm/s)	0.0952	0.476	0.0952	40
	Frequency (Hz)	7.7	7.5	7.6	
Sitio 13 LO T2	PPV (mm/s)	0.127	0.603	0.143	38
	Frequency (Hz)	7.7	7.6	7.7	
Sitio 13 LP T1	PPV (mm/s)	0.111	0.159	0.0952	40
	Frequency (Hz)	7.3	7.4	7.5	
Sitio 13 LP T2	PPV (mm/s)	0.0952	0.143	0.111	38
	Frequency (Hz)	7.3	7.4	7.5	
Sitio 14 LO T1	PPV (mm/s)	0.0952	0.143	0.127	38
	Frequency (Hz)	7.8	7.6	7.7	
Sitio 14 LO T2	PPV (mm/s)	0.111	0.206	0.159	42
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 14 LP T1	PPV (mm/s)	0.0794	0.111	0.111	38
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 14 LP T2	PPV (mm/s)	0.0794	0.127	0.127	42
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 15 LO T1	PPV (mm/s)	0.0794	0.222	0.0794	50
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 15 LO T2	PPV (mm/s)	0.0952	0.19	0.0952	48
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 15 LP T1	PPV (mm/s)	0.0794	0.127	0.127	50

LOCALIDAD	PARÁMETRO	Dirección transversal	Dirección vertical	Dirección Longitudinal	Velocidad de la unidad (Km/h)
Sitio 15 LP T2	Frequency (Hz)	7.3	7.4	7.4	48
	PPV (mm/s)	0.0635	0.0952	0.111	
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 16 LO T1	PPV (mm/s)	0.159	0.556	0.143	47
	Frequency (Hz)	7.8	7.5	7.7	
Sitio 16 LO T2	PPV (mm/s)	0.159	0.524	0.143	45
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 16 LP T1	PPV (mm/s)	0.0952	0.175	0.143	47
	Frequency (Hz)	7.2	7.4	7.4	
Sitio 16 LP T2	PPV (mm/s)	0.0952	0.111	0.0952	45
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 17 LO T1	PPV (mm/s)	0.0794	0.302	0.111	40
	Frequency (Hz)	7.8	7.5	7.7	
Sitio 17 LO T2	PPV (mm/s)	0.0794	0.254	0.0952	40
	Frequency (Hz)	7.7	7.5	7.6	
Sitio 17 LP T1	PPV (mm/s)	0.111	0.222	0.127	40
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 17 LP T2	PPV (mm/s)	0.0952	0.175	0.111	40
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 18 LO T1	PPV (mm/s)	0.413	0.381	0.286	35
	Frequency (Hz)	7.8	7.6	7.8	
Sitio 18 LO T2	PPV (mm/s)	0.313	0.381	0.286	Frenando
	Frequency (Hz)	7.8	7.6	7.8	
Sitio 18 LP T1	PPV (mm/s)	0.0952	0.54	0.143	45
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 18 LP T2	PPV (mm/s)	0.0952	0.238	0.0952	Frenando
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 19 LO T1	PPV (mm/s)	0.111	0.206	0.159	30
	Frequency (Hz)	7.8	7.6	7.7	
Sitio 19 LO T2	PPV (mm/s)	0.413	0.381	0.286	29
	Frequency (Hz)	7.8	7.6	7.8	
Sitio 19 LP T1	PPV (mm/s)	0.0794	0.0952	0.19	30
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 19 LP T2	PPV (mm/s)	0.127	0.127	0.19	29
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 20 LO T1	PPV (mm/s)	0.0794	0.143	0.111	40
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 20 LO T2	PPV (mm/s)	0.0794	0.222	0.0794	42
	Frequency (Hz)	7.8	7.6	7.8	
Sitio 20 LP T1	PPV (mm/s)	0.0794	0.0952	0.19	40

LOCALIDAD	PARÁMETRO	Dirección transversal	Dirección vertical	Dirección Longitudinal	Velocidad de la unidad (Km/h)
Sitio 20 LP T2	Frequency (Hz)	7.3	7.4	7.4	42
	PPV (mm/s)	0.0694	0.0852	0.19	
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 21 LO T1	PPV (mm/s)	0.0635	0.127	0.0635	40
	Frequency (Hz)	7.8	7.6	7.7	
Sitio 21 LO T2	PPV (mm/s)	0.0794	0.19	0.0794	42
	Frequency (Hz)	7.7	7.6	7.7	
Sitio 21 LP T1	PPV (mm/s)	0.0794	0.0952	0.0794	40
	Frequency (Hz)	7.4	7.5	7.5	
Sitio 21 LP T2	PPV (mm/s)	0.0794	0.127	0.0952	42
	Frequency (Hz)	7.4	7.5	7.5	
Sitio 22 LO T1	PPV (mm/s)	0.0794	0.238	0.127	43
	Frequency (Hz)	7.8	7.6	7.8	
Sitio 22 LO T2	PPV (mm/s)	0.0794	0.175	0.0952	40
	Frequency (Hz)	7.8	7.5	7.7	
Sitio 22 LP T1	PPV (mm/s)	0.127	0.286	0.143	43
	Frequency (Hz)	7.4	7.5	7.5	
Sitio 22 LP T2	PPV (mm/s)	0.0952	0.19	0.111	40
	Frequency (Hz)	7.3	7.4	7.5	
Sitio 23 LO T1	PPV (mm/s)	0.111	0.302	0.159	45
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 23 LO T2	PPV (mm/s)	0.19	0.492	0.286	45
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 23 LP T1	PPV (mm/s)	0.111	0.222	0.159	45
	Frequency (Hz)	7.4	7.5	7.5	
Sitio 23 LP T2	PPV (mm/s)	0.111	0.19	0.127	45
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 24 LO T1	PPV (mm/s)	0.0635	0.127	0.0794	40
	Frequency (Hz)	7.8	7.6	7.7	
Sitio 24 LO T2	PPV (mm/s)	0.0794	0.238	0.0952	45
	Frequency (Hz)	7.8	7.6	7.7	
Sitio 24 LP T1	PPV (mm/s)	0.0794	0.127	0.111	40
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 24 LP T2	PPV (mm/s)	0.0952	0.127	0.143	45
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 25 LO T1	PPV (mm/s)	0.0794	0.159	0.0794	40
	Frequency (Hz)	7.8	7.6	7.7	
Sitio 25 LO T2	PPV (mm/s)	0.0794	0.206	0.0794	39
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 25 LP T1	PPV (mm/s)	0.0694	0.207	0.095	40

LOCALIDAD	PARÁMETRO	Dirección transversal	Dirección vertical	Dirección Longitudinal	Velocidad de la unidad (Km/h)
Sitio 25 LP T2	Frequency (Hz)	7.3	7.4	7.4	39
	PPV (mm/s)	0.0794	0.206	0.0952	
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 26 LO T1	PPV (mm/s)	0.127	0.27	0.127	45
	Frequency (Hz)	7.8	7.6	7.8	
Sitio 26 LO T2	PPV (mm/s)	0.0794	0.127	0.0794	45
	Frequency (Hz)	7.8	7.6	7.7	
Sitio 26 LP T1	PPV (mm/s)	0.0952	0.381	0.111	45
	Frequency (Hz)	7.4	7.4	7.4	
Sitio 26 LP T2	PPV (mm/s)	0.0794	0.159	0.0952	45
	Frequency (Hz)	7.4	7.4	7.4	
Sitio 27 LO T1	PPV (mm/s)	0.0952	0.127	0.0794	35
	Frequency (Hz)	7.8	7.5	7.7	
Sitio 27 LO T2	PPV (mm/s)	0.0952	0.286	0.175	35
	Frequency (Hz)	7.8	7.6	7.7	
Sitio 27 LP T1	PPV (mm/s)	0.0794	0.127	0.111	35
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 27 LP T2	PPV (mm/s)	0.0952	0.206	0.111	35
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 28 LO T1	PPV (mm/s)	0.0794	0.127	0.0635	40
	Frequency (Hz)	7.8	7.6	7.8	
Sitio 28 LO T2	PPV (mm/s)	0.0794	0.175	0.0635	45
	Frequency (Hz)	7.8	7.6	7.7	
Sitio 28 LP T1	PPV (mm/s)	0.127	0.254	0.19	40
	Frequency (Hz)	7.4	7.4	7.4	
Sitio 28 LP T2	PPV (mm/s)	0.127	0.302	0.222	45
	Frequency (Hz)	7.4	7.4	7.4	
Sitio 29 LO T1	PPV (mm/s)	0.0794	0.111	0.0794	20
	Frequency (Hz)	7.8	7.5	7.8	
Sitio 29 LO T2	PPV (mm/s)	0.0635	0.143	0.0635	40
	Frequency (Hz)	7.8	7.6	7.8	
Sitio 29 LP T1	PPV (mm/s)	0.0794	0.111	0.0952	20
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 29 LP T2	PPV (mm/s)	0.0952	0.143	0.127	40
	Frequency (Hz)	7.3	7.4	7.4	
Sitio 30 LO T1	PPV (mm/s)	0.0794	0.381	0.0794	Entrada a estación
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 30 LO T2	PPV (mm/s)	0.0635	0.238	0.0635	Entrada a estación
	Frequency (Hz)	7.7	7.5	7.7	
Sitio 30 LP T1	PPV (mm/s)	0.0635	0.127	0.0952	

LOCALIDAD	PARÁMETRO	Dirección transversal	Dirección vertical	Dirección Longitudinal	Velocidad de la unidad (Km/h)
	Frequency (Hz)	7.3	7.4	7.4	Entrada a estación
Sitio 30 LP T2	PPV (mm/s)	0.0952	0.159	0.0952	Entrada a estación
	Frequency (Hz)	7.3	7.4	7.4	

PPV.- Velocidad máxima de Partícula  
T1.- Trayecto 1 (cuarto carril)

LP.- Lado Poniente  
T2.- Trayecto 2 (quinto carril)

LO.- Lado Oriente

### 3 CONCLUSIONES Y RECOMENDACIONES

- Se realizó el registro de vibración inducida por el paso del camión del Metrobús, en 30 puntos colocando dos instrumentos de medición, uno en cada lado de la acera con el objeto de conocer la influencia en los dos extremos de la calle.
- Las aceras se denominaron LO (Lado Oriente) para el extremo Oriente y LP (Lado Poniente) para el extremo Poniente de la Avenida.
- Tomando en cuenta la configuración de carriles por la que se prevé que circulará el metrobús, se consideraron dos escenarios para la toma de lecturas: El primero considera el registro de vibración inducida en ambos lados de la acera, cuando el camión del Metrobús circula por el cuarto carril de Poniente a Oriente (T1.- Trayectoria 1). El segundo considera el registro de vibración inducida en ambos lado de la acera, cuando el camión del Metrobús, circula por el quinto carril de Poniente a oriente (T2.- Trayectoria 2).
- Se obtuvieron 120 registros de vibración a lo largo de la trayectoria de ampliación de la Línea 3 del metrobús.
- Para los registros se utilizó un camión de Metrobús articulado, de 18 m de longitud, con un peso neto de 30 Toneladas.
- Los sitios ubicados en el Lado Oriente se encuentran aproximadamente a 15.5m de la trayectoria T1 y a 12 m de la trayectoria T2. Mientras que los sitios ubicados en el Lado Poniente se encuentran a aproximadamente 20 m de la trayectoria T1 y a 23.5 m de la trayectoria T2.
- De los 120 registros se obtuvieron velocidades máximas de partícula (PPV) de entre 0.0852 mm/s y 0.984 mm/s, correspondiendo el valor más alto al Sitio 8 LO T1 (Lado Oriente, en la Trayectoria 1, cuarto carril) y se debe al paso de Metrobús, tráfico vehicular y el paso de un tráiler.
- Las frecuencias dominantes para las ondas inducidas por el paso del camión del Metrobús y demás tráfico vehicular, es de entre 7.2 y 7.7 Hz.
- En ninguno de los casos registrados el valor máximo de velocidad (PPV) sobrepasa 1 mm/s por lo que de acuerdo a las normas de referencia descritas en la sección 1.3.2, las ondas inducidas por el paso del Metrobús y demás tráfico vehicular, no genera vibraciones que puedan causar daño a las construcciones aledañas, solamente en los Sitios 3 LO T2, Sitios 13 LO T2 y Sitios 16 LO T2, se registraron valores máximo de velocidad (PPV) de 0.698, 0.603 y 0.524 mm/s respectivamente, por lo que en estos lugares personas sensibles pueden estar en el umbral de percepción de las ondas inducidas por el paso del Metrobús y demás tráfico vehicular, al ser valores mayores a 0.5 mm/s.

#### 4 REFERENCIAS

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3. Fabela Gallegos M., Hernández Jiménez J., et al. (2002). Vibración durante el transporte y su efecto en perecederos. Enfoque introductorio Publicación Técnica No. 188 Sanfandila, Qro. 2002
4. Vacca Gámez H., Ruiz Valencia D., (2011). Medición e interpretación de vibraciones producidas por el tráfico en Bogotá D.C., Pontificia Universidad Javeriana, Bogotá. COLOMBIA. Revista Ingeniería de Construcción Vol. 26 No. 20021, Abril de 2011 [www.ing.puc.cl/ric](http://www.ing.puc.cl/ric)

Elaboró:



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Revisó



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Aprobó



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**Anexo A**  
**Registros de exploración geofísica**



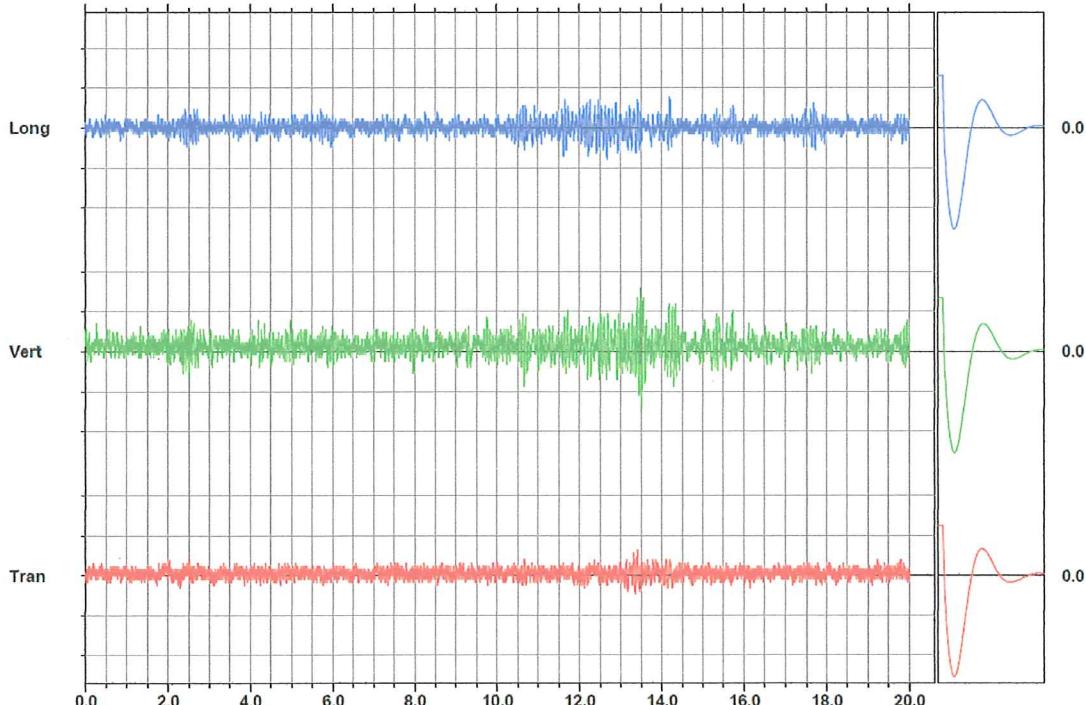
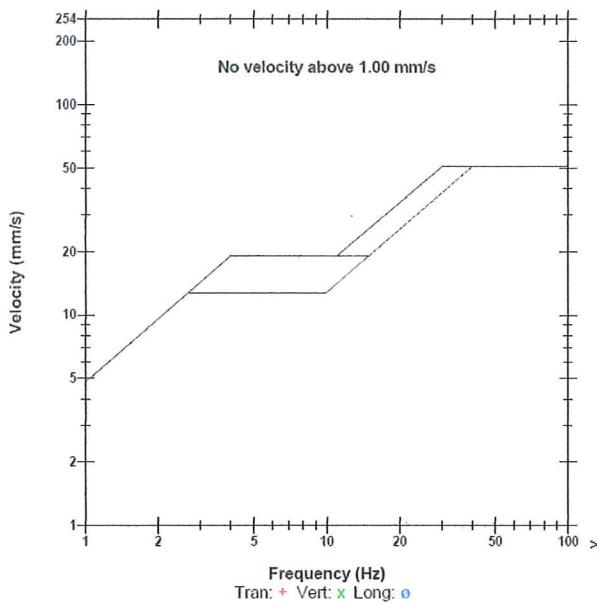


### Event Report

Date/Time Manual at 08:41:35 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1  
**Notes**  
 Location: SITIO 1 LO T1, METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO1

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I62Y.TB0

#### USBM RI8507 And OSMRE



Sensor Check



## Event Report

Date/Time Manual at 09:20:09 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I630.LLO

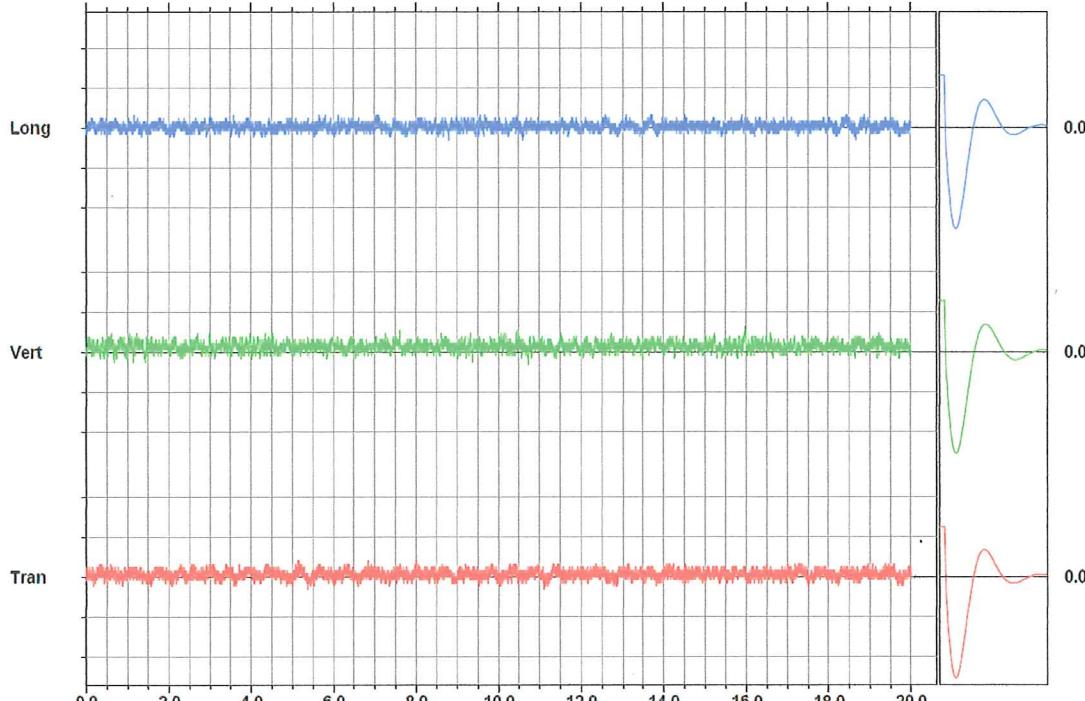
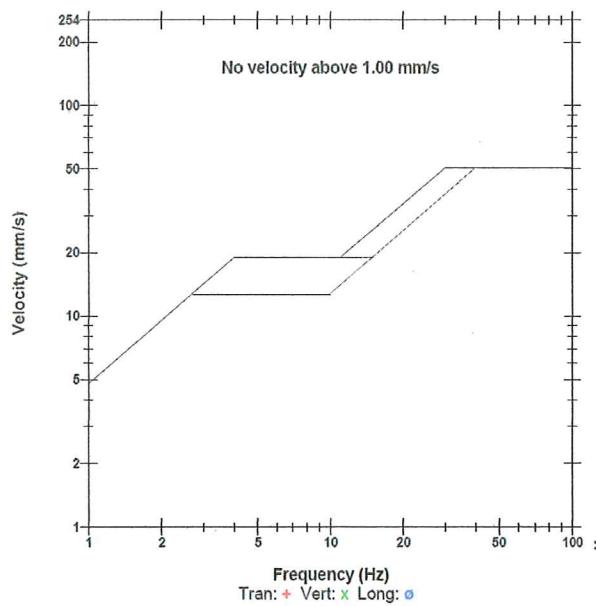
**Notes**  
 Location: SITIO 1 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO 1

### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.127	0.0635	mm/s
PPV	29.0	33.1	27.1	dB
ZC Freq	39	8.5	>100	Hz
Time (Rel. to Trig)	5.140	15.980	1.168	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00082	0.00251	0.00050	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.5	7.7	Hz
Overswing Ratio	3.8	3.7	3.7	

Peak Vector Sum 0.128 mm/s at 15.980 sec

### USBM RI8507 And OSMRE



Sensor Check



## Event Report

Date/Time Manual at 08:40:45 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 16

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I62Y.RX0

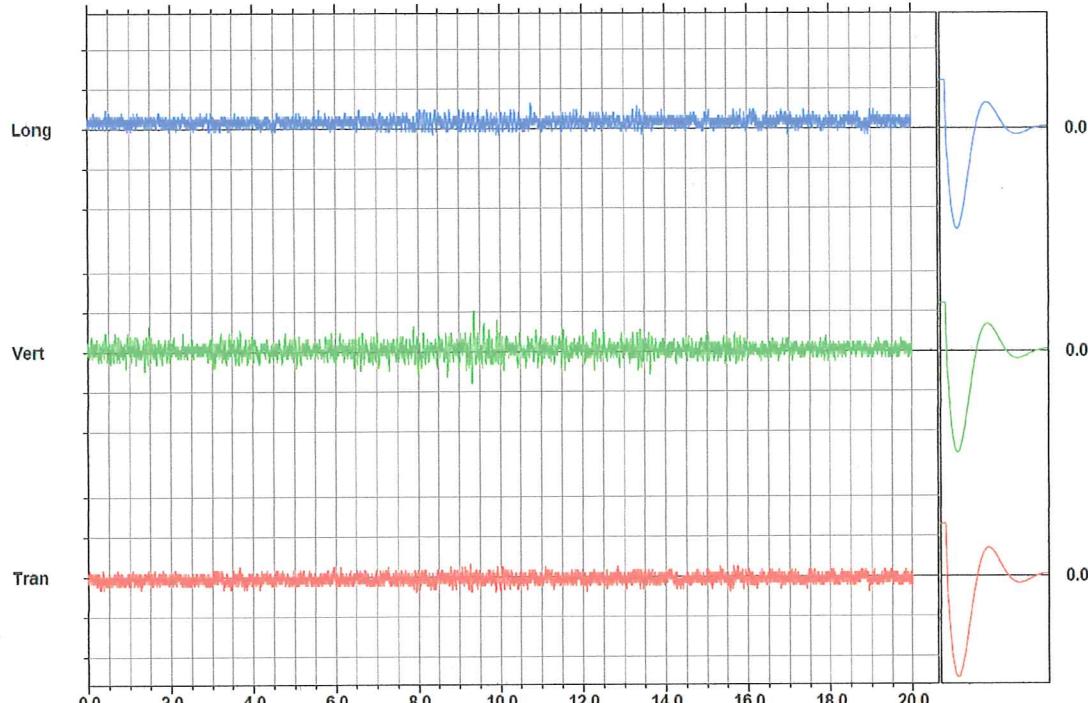
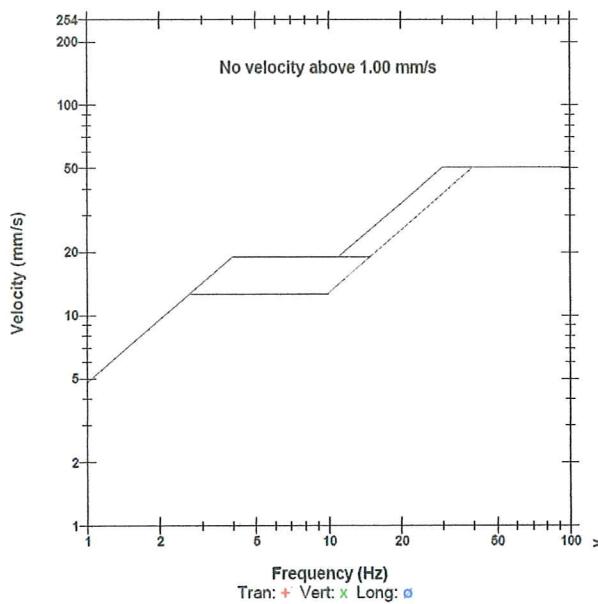
Notes  
 Location: SITIO1 LP T1, METROBUS L3  
 Client:  
 User Name:  
 General:

### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.206	0.127	mm/s
PPV	29.0	37.3	33.1	dB
ZC Freq	17	10	10	Hz
Time (Rel. to Trig)	7.953	9.354	10.762	sec
Peak Acceleration	0.00663	0.00863	0.00829	g
Peak Displacement	0.00091	0.00321	0.00253	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.217 mm/s at 9.361 sec

### USBM RI8507 And OSMRE





### Event Report

Date/Time Manual at 09:19:17 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 16

Notes  
 Location: SITIO 1 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

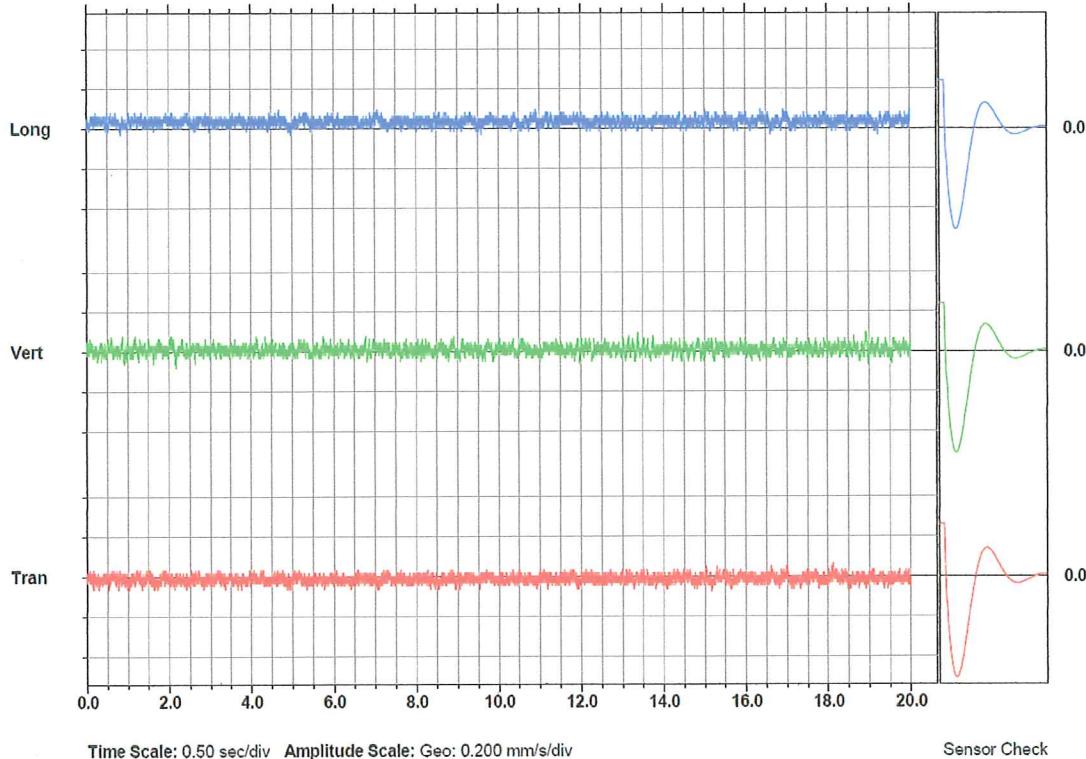
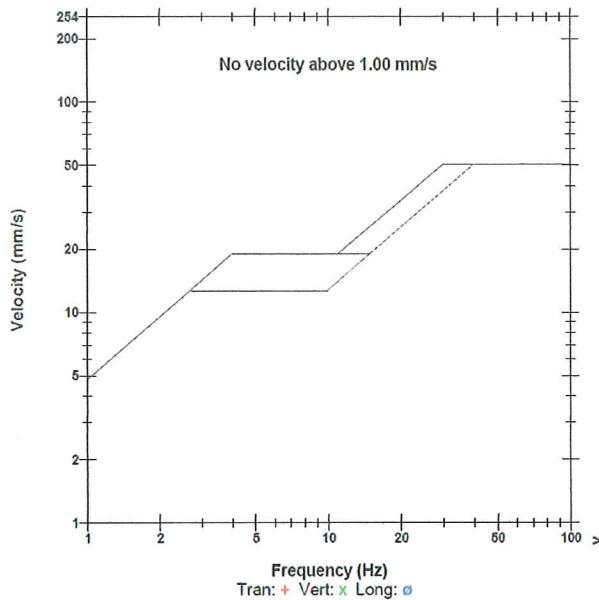
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.0952	0.0952	mm/s
PPV	29.0	30.6	30.6	dB
ZC Freq	37	11	10	Hz
Time (Rel. to Trig)	15.162	13.379	4.687	sec
Peak Acceleration	0.00829	0.00829	0.00663	g
Peak Displacement	0.00083	0.00168	0.00386	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.120 mm/s at 18.922 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I630.K50

#### USBM RI8507 And OSMRE





### Event Report

Date/Time Manual at 09:51:42 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 2 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO2

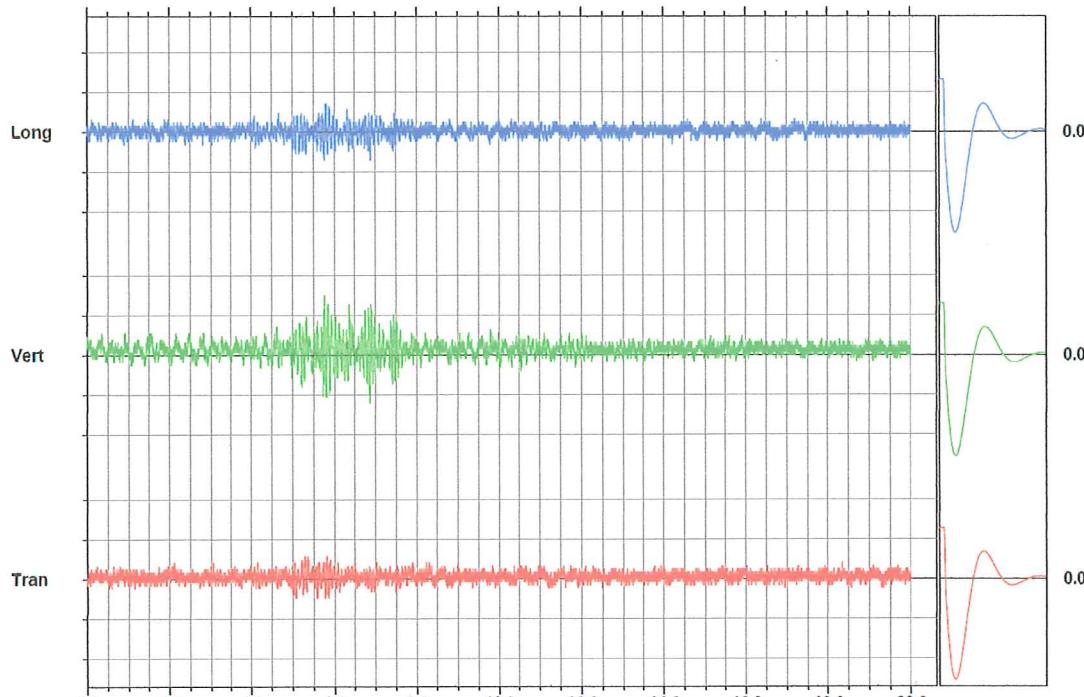
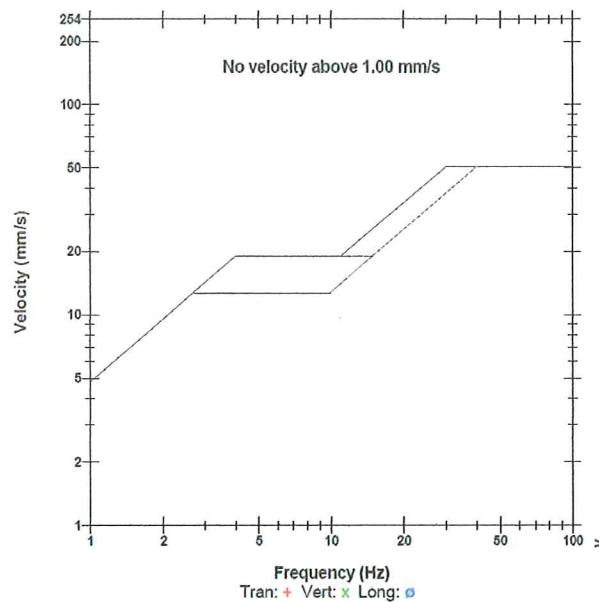
#### Extended Notes

	Tran	Vert	Long		mm/s
PPV	0.111	0.302	0.143		dB
PPV	31.9	40.6	34.1		Hz
ZC Freq	12	12	13		sec
Time (Rel. to Trig)	5.283	5.769	5.763		g
Peak Acceleration	0.00663	0.00663	0.00663		mm
Peak Displacement	0.00154	0.00414	0.00171		
Sensor Check	Passed	Passed	Passed		
Frequency	7.8	7.6	7.8		Hz
Overswing Ratio	3.8	3.7	3.6		

Peak Vector Sum 0.331 mm/s at 5.770 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q5791632.260

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 10:11:47 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

**Notes**  
 Location: SITIO 2 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO2

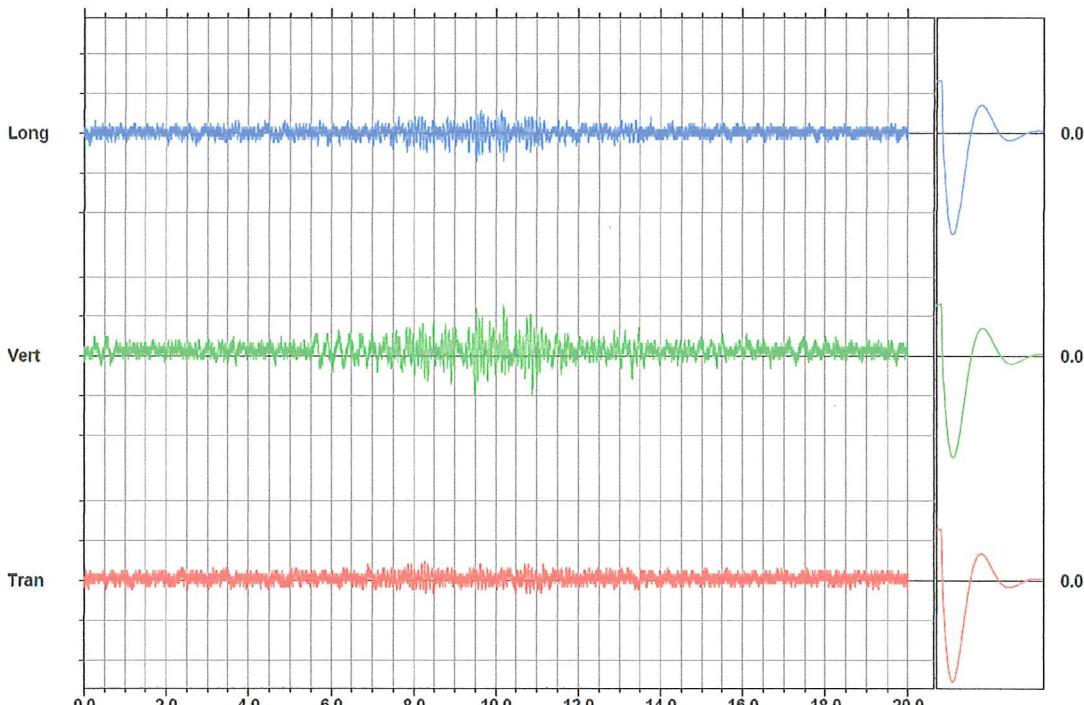
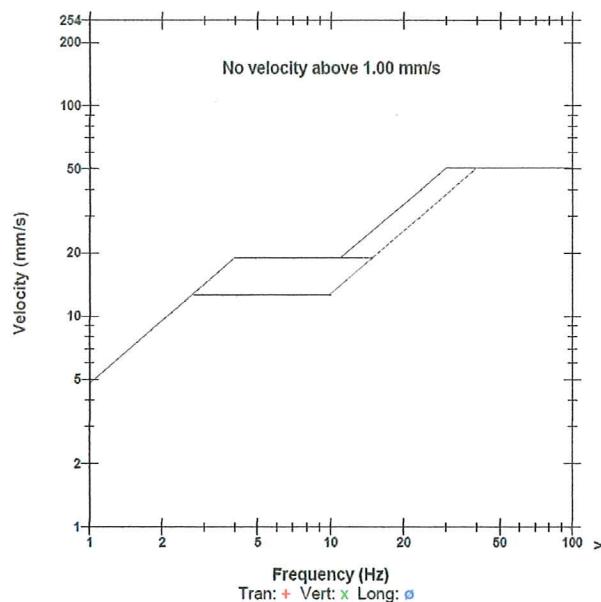
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.254	0.143	mm/s
PPV	30.6	39.1	34.1	dB
ZC Freq	18	10	14	Hz
Time (Rel. to Trig)	8.266	10.186	9.512	sec
Peak Acceleration	0.00663	0.00663	0.00663	g
Peak Displacement	0.00102	0.00479	0.00180	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.8	Hz
Overswing Ratio	3.8	3.7	3.6	

Peak Vector Sum 0.284 mm/s at 10.186 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q5791632.ZNO

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 09:52:56 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 17

**Notes**  
 Location: SITIO 2 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

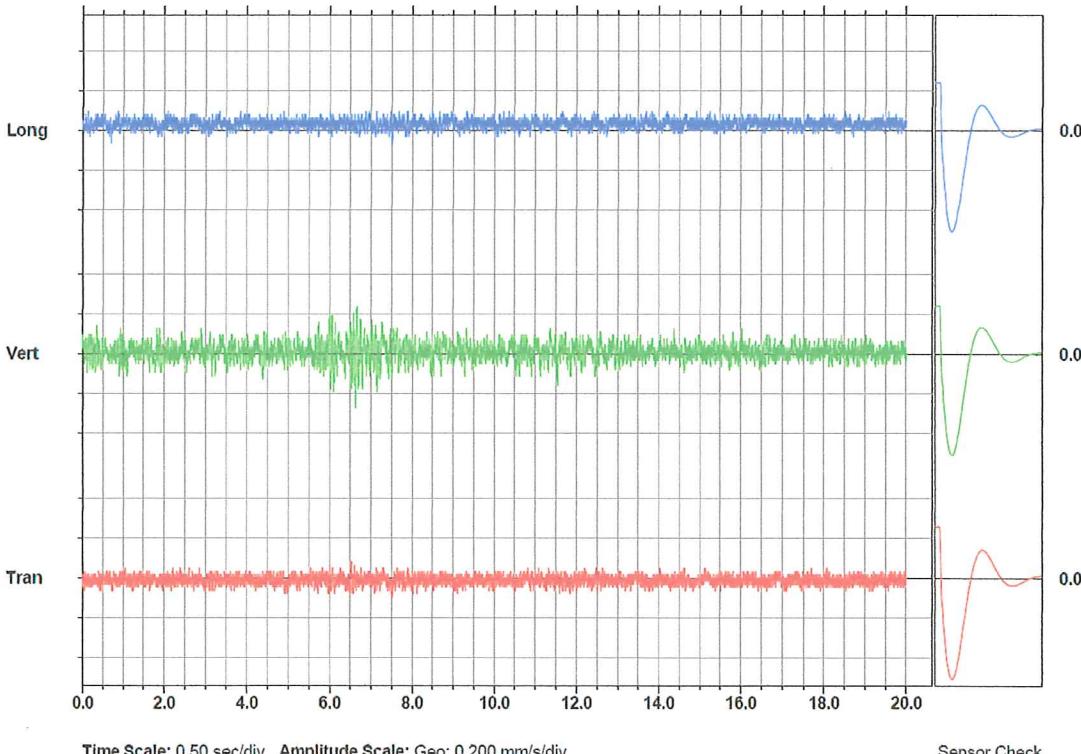
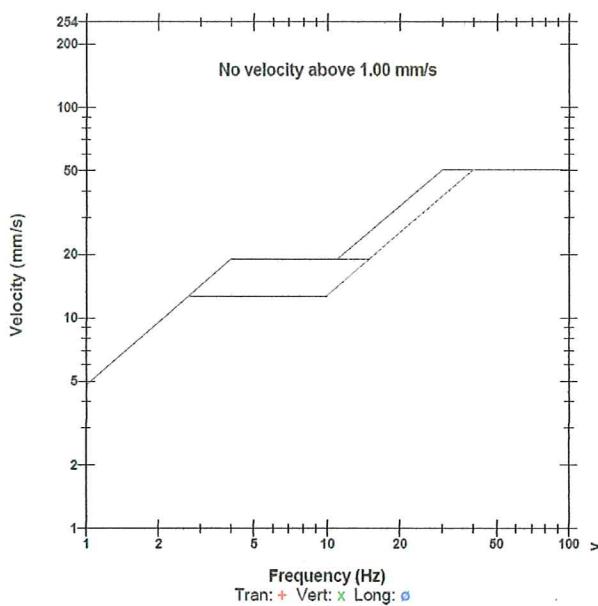
#### Extended Notes

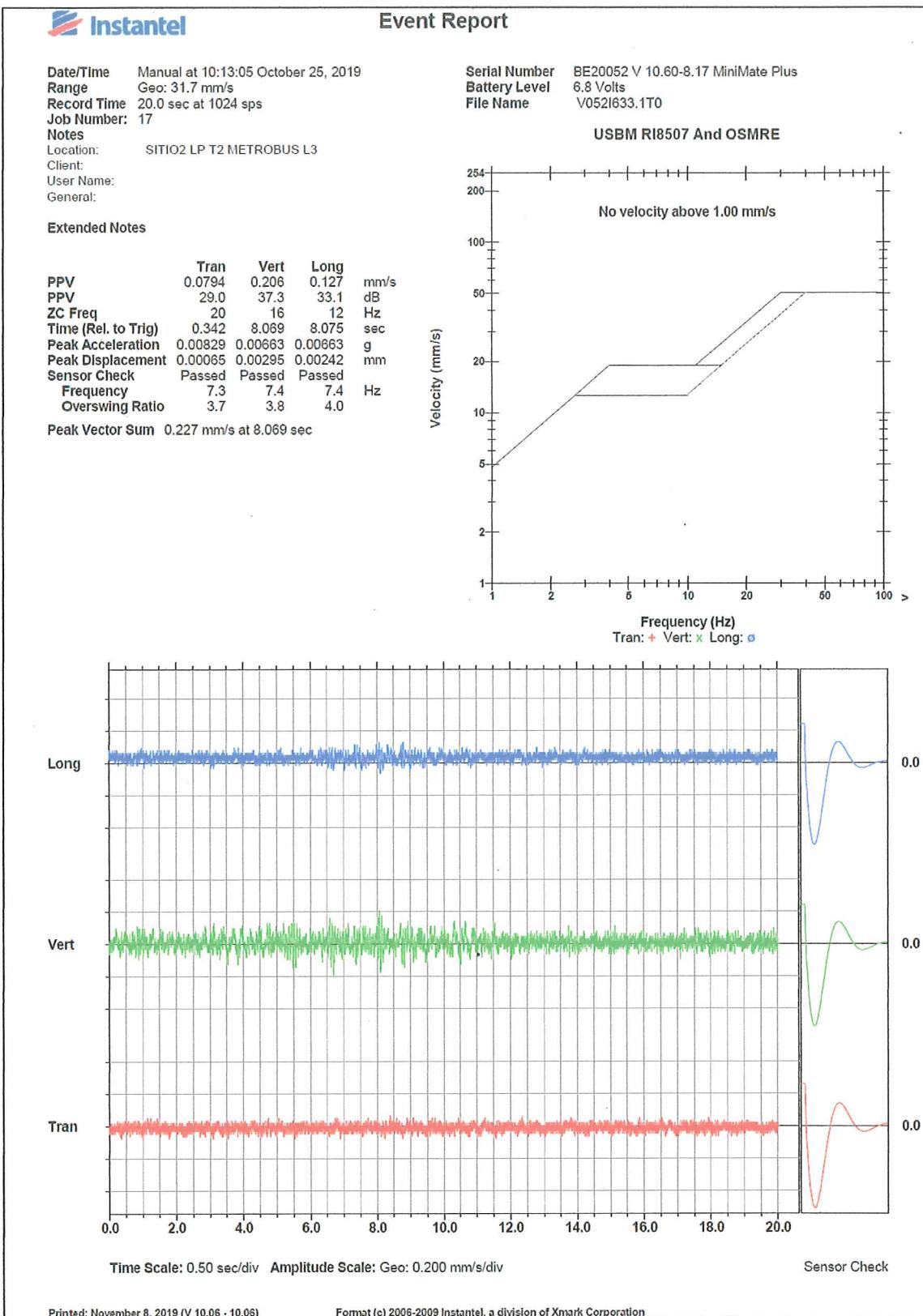
	Tran	Vert	Long	
PPV	0.0952	0.270	0.0952	mm/s
PPV	30.6	39.6	30.6	dB
ZC Freq	14	12	34	Hz
Time (Rel. to Trig)	7.518	6.627	0.140	sec
Peak Acceleration	0.00829	0.00829	0.00663	g
Peak Displacement	0.00089	0.00405	0.00220	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.272 mm/s at 6.627 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I632.480

#### USBM RI8507 And OSMRE







## Event Report

Date/Time Manual at 10:29:30 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 3 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO3

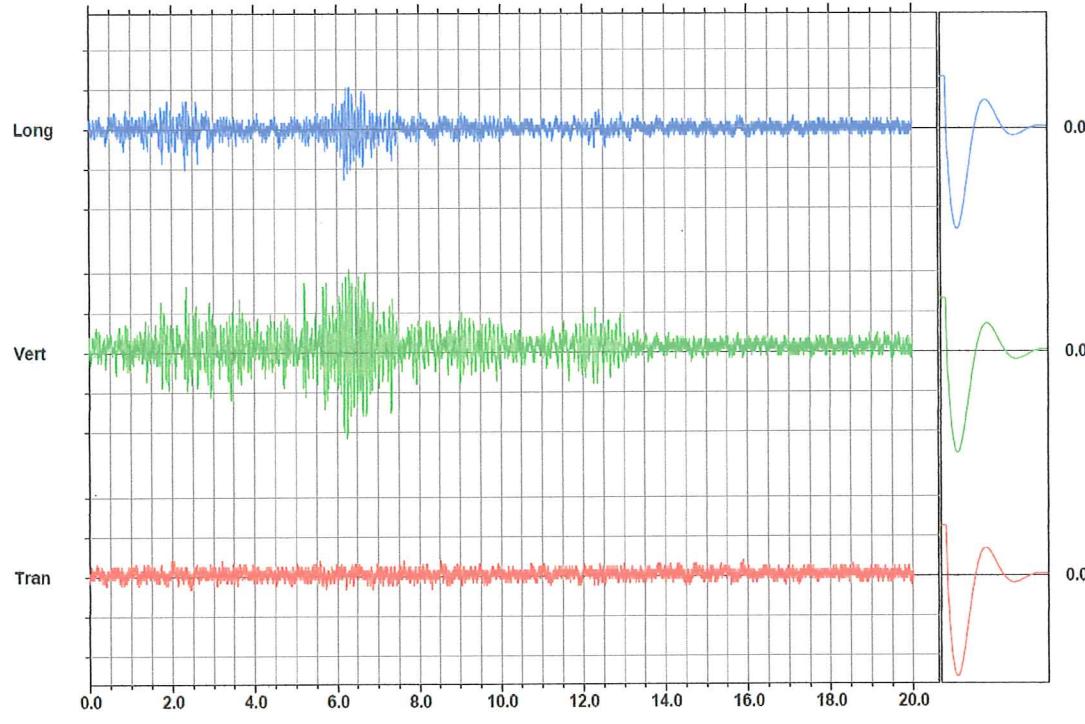
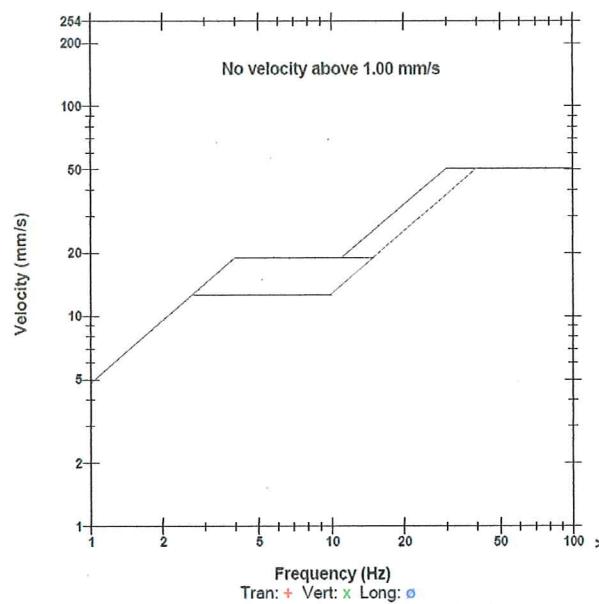
### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.429	0.254	mm/s
PPV	29.0	43.6	39.1	dB
ZC Freq	64	14	13	Hz
Time (Rel. to Trig)	1.969	6.260	6.190	sec
Peak Acceleration	0.00863	0.00829	0.00663	g
Peak Displacement	0.00083	0.00607	0.00305	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.5	7.7	Hz
Overswing Ratio	3.8	3.7	3.6	

Peak Vector Sum 0.457 mm/s at 6.261 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I633.T60

### USBM RI8507 And OSMRE



Sensor Check

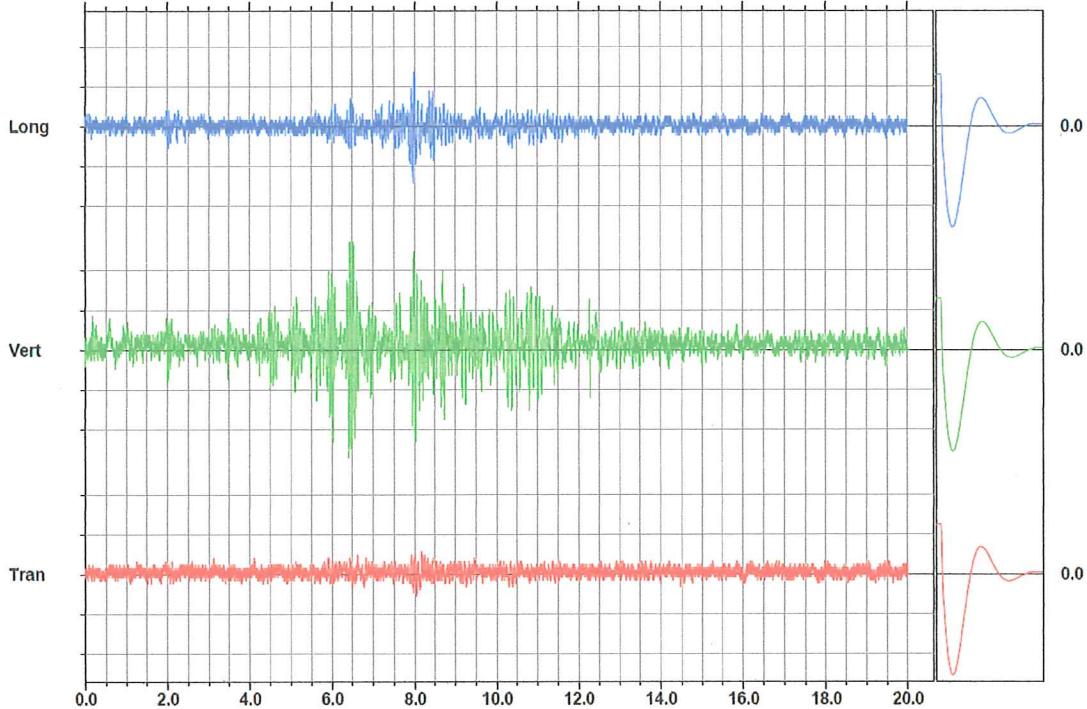
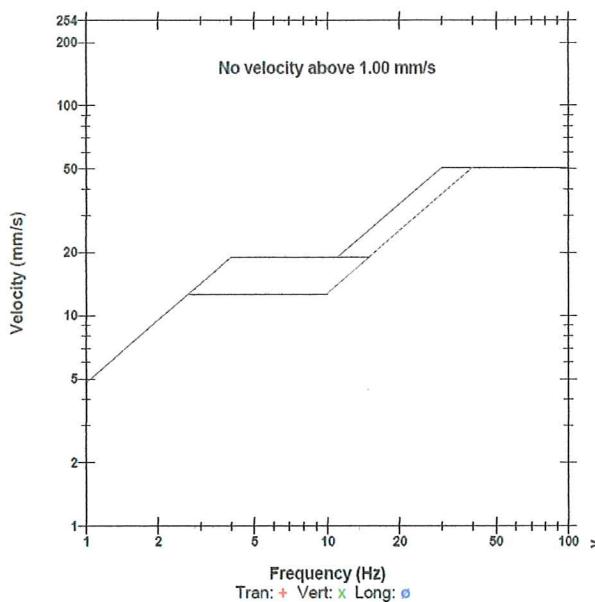


### Event Report

Date/Time Manual at 10:47:34 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1  
**Notes**  
 Location: SITIO 3 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO3

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I634.NA0

#### USBM RI8507 And OSMRE



Sensor Check

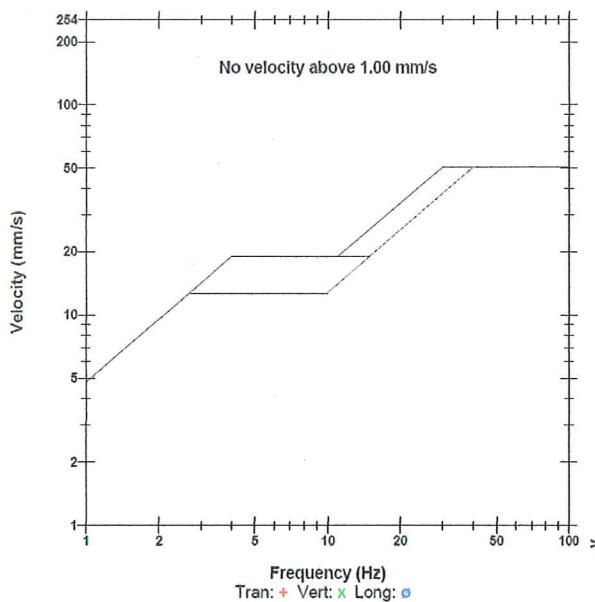


### Event Report

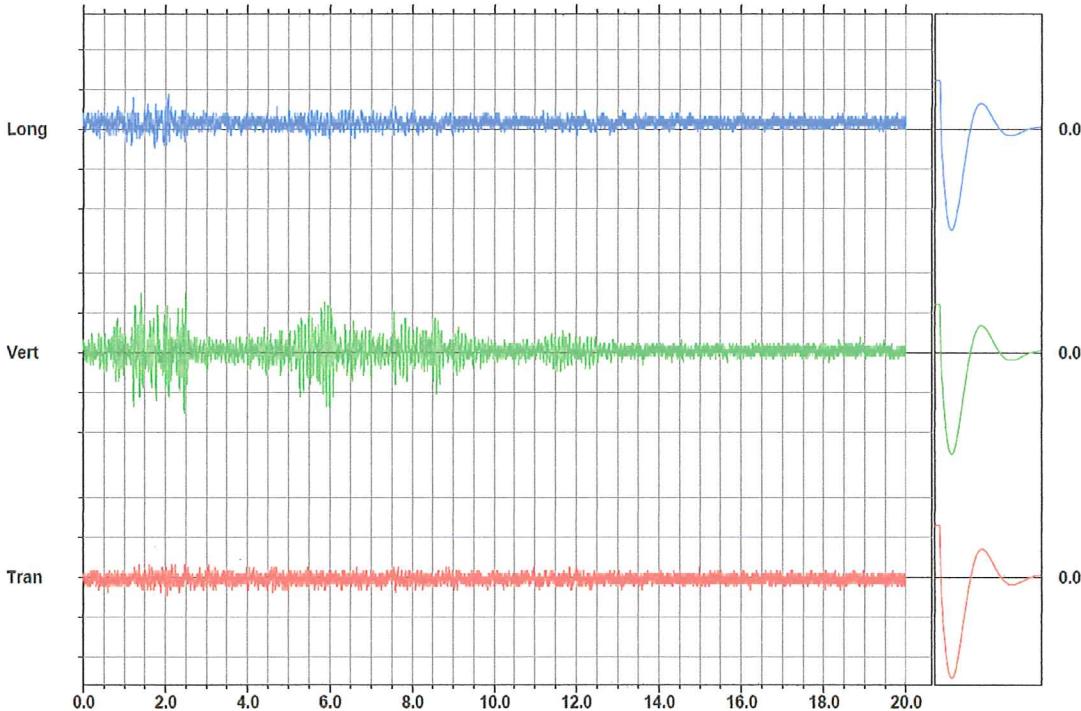
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 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
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**Notes**  
 Location: SITIO 3 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V0521633.R50

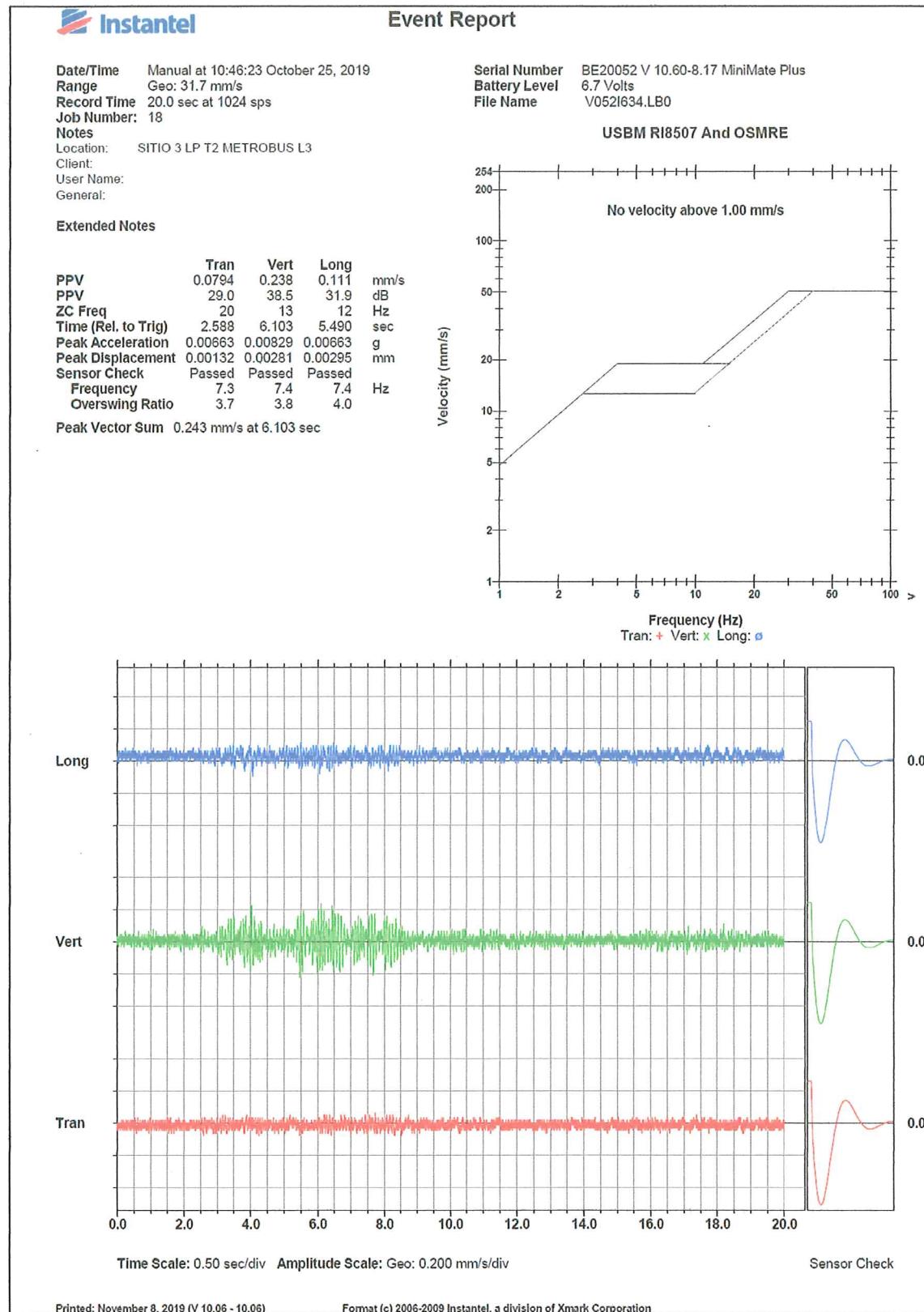
#### USBM RI8507 And OSMRE



Peak Vector Sum 0.318 mm/s at 2.482 sec



Sensor Check





### Event Report

Date/Time Manual at 11:05:49 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

**Notes**

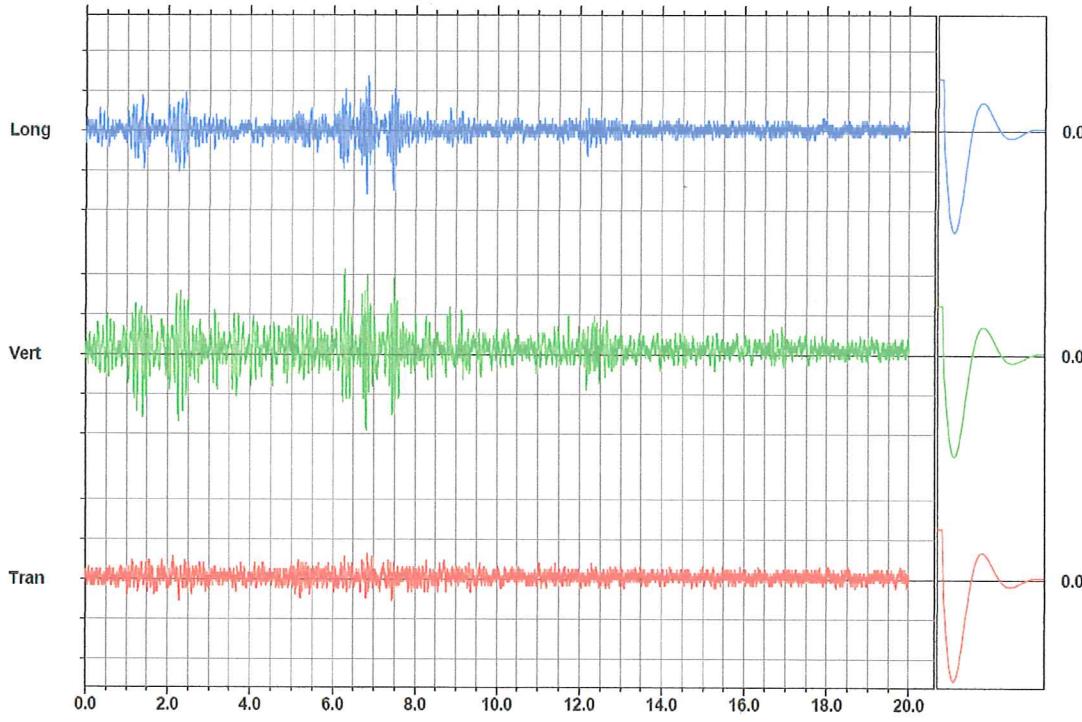
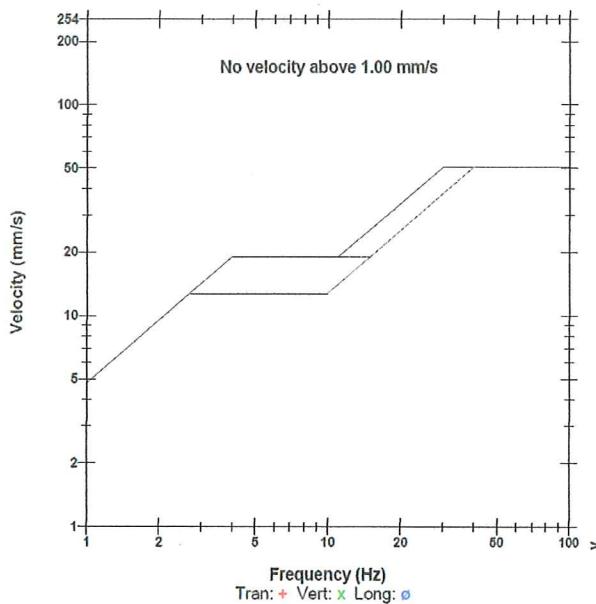
Location: SITIO 4 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO4

**Extended Notes**

	Tran	Vert	Long	
PPV	0.127	0.429	0.317	mm/s
PPV	33.1	43.6	41.0	dB
ZC Freq	17	11	14	Hz
Time (Rel. to Trig)	6.843	6.289	6.812	sec
Peak Acceleration	0.00863	0.00863	0.00829	g
Peak Displacement	0.00156	0.00586	0.00364	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.8	Hz
Overswing Ratio	3.8	3.6	3.6	

Peak Vector Sum 0.493 mm/s at 6.812 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I635.HPO

**USBM RI8507 And OSMRE**


Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check



### Event Report

Date/Time Manual at 11:23:57 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

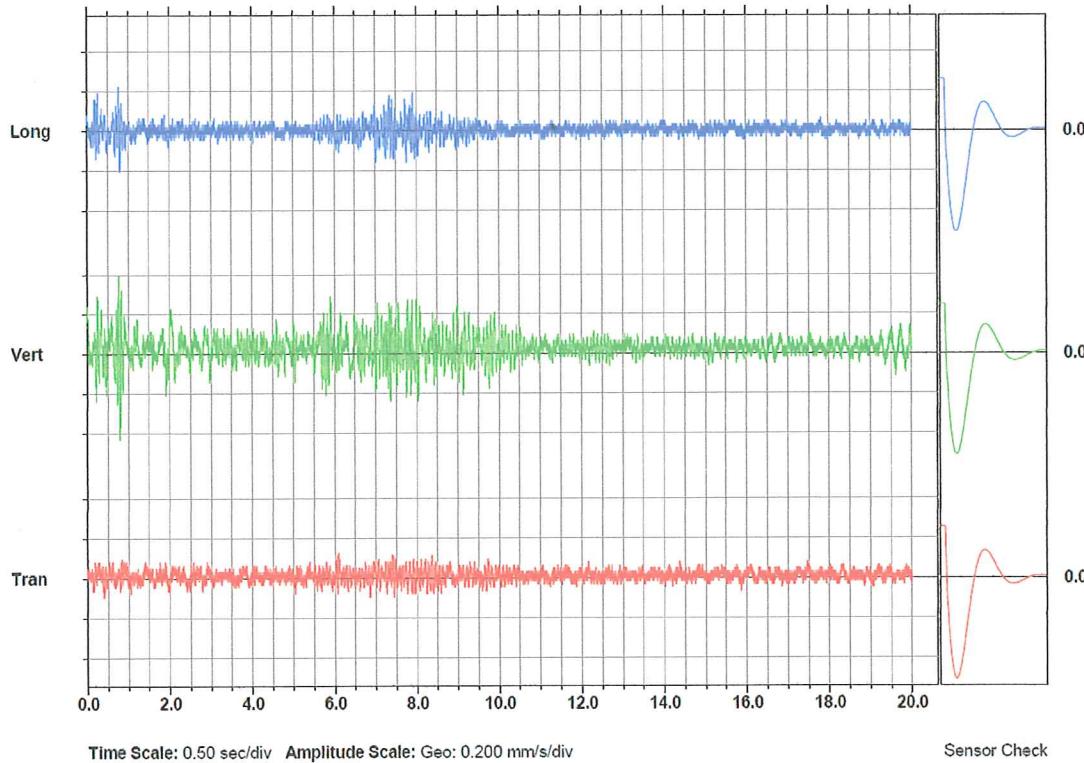
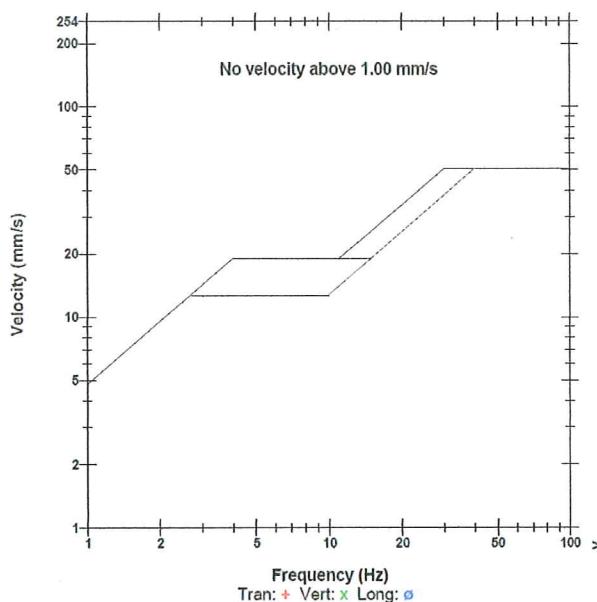
**Notes**  
 Location: SITIO 4 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO4

#### Extended Notes

	Tran	Vert	Long	
PPV	0.127	0.429	0.222	mm/s
PPV	33.1	43.6	37.9	dB
ZC Freq	12	16	16	Hz
Time (Rel. to Trig)	6.109	0.798	0.771	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00167	0.00721	0.00212	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.6	7.7	Hz
Overswing Ratio	3.8	3.6	3.6	
Peak Vector Sum	0.465 mm/s at 0.798 sec			

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I636.BX0

#### USBM RI8507 And OSMRE





### Event Report

Date/Time Manual at 11:06:13 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 19

Notes  
 Location: SITIO 4 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

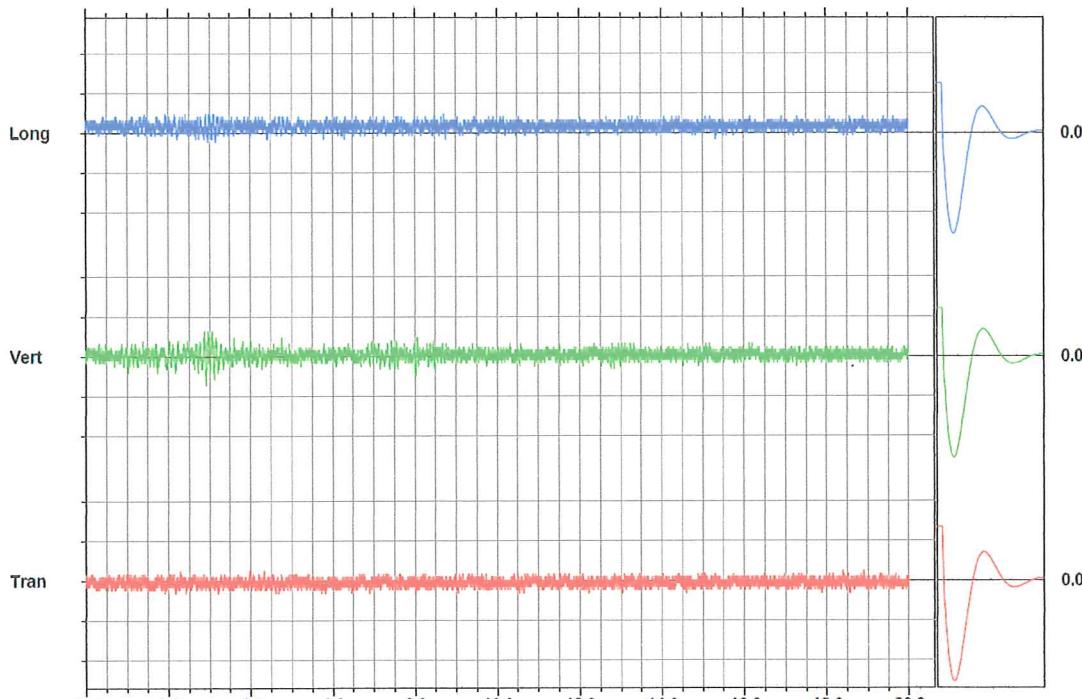
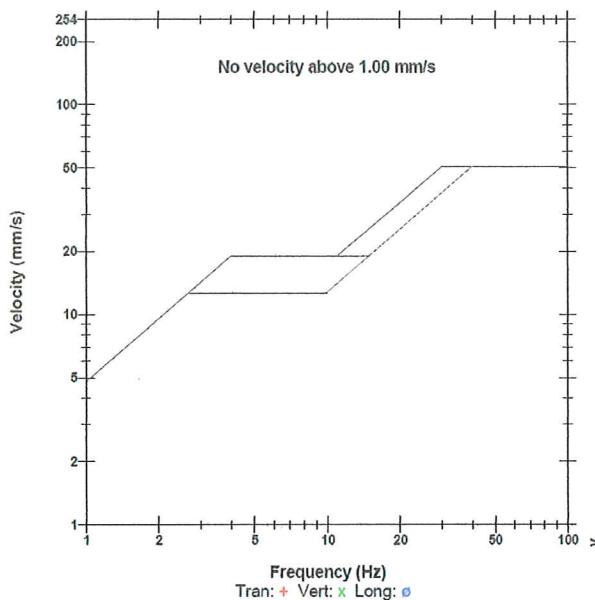
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0635	0.143	0.0952	mm/s
PPV	27.1	34.1	30.6	dB
ZC Freq	43	13	7.3	Hz
Time (Rel. to Trig)	1.913	2.927	1.419	sec
Peak Acceleration	0.00663	0.00663	0.00829	g
Peak Displacement	0.00040	0.00164	0.00196	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.7	3.8	3.9	

Peak Vector Sum 0.150 mm/s at 2.919 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I635.ID0

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 11:24:23 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 19

Notes  
 Location: SITIO 4 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

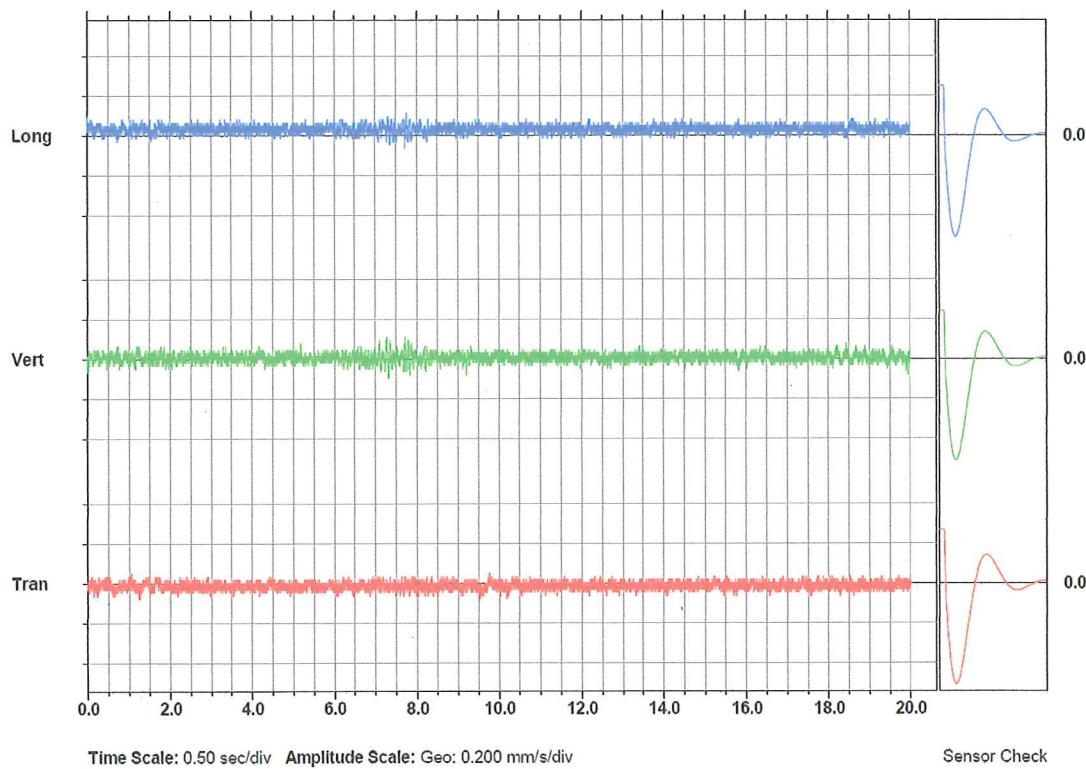
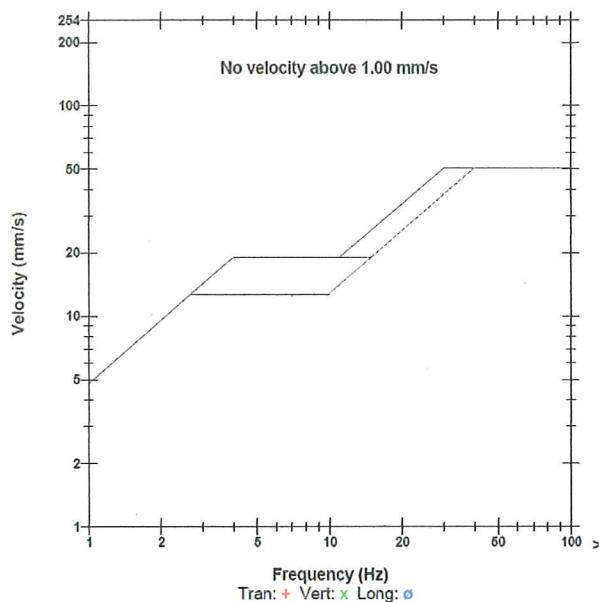
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.111	0.111	mm/s
PPV	29.0	31.9	31.9	dB
ZC Freq	20	13	14	Hz
Time (Rel. to Trig)	1.236	7.287	7.768	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00061	0.00125	0.00197	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.3	7.4	7.4	
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.128 mm/s at 7.315 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I636.CN0

#### USBM RI8507 And OSMRE





**Event Report**

Date/Time Manual at 11:52:13 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps

Job Number: 1  
**Notes**  
 Location: SITI 5 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIOS

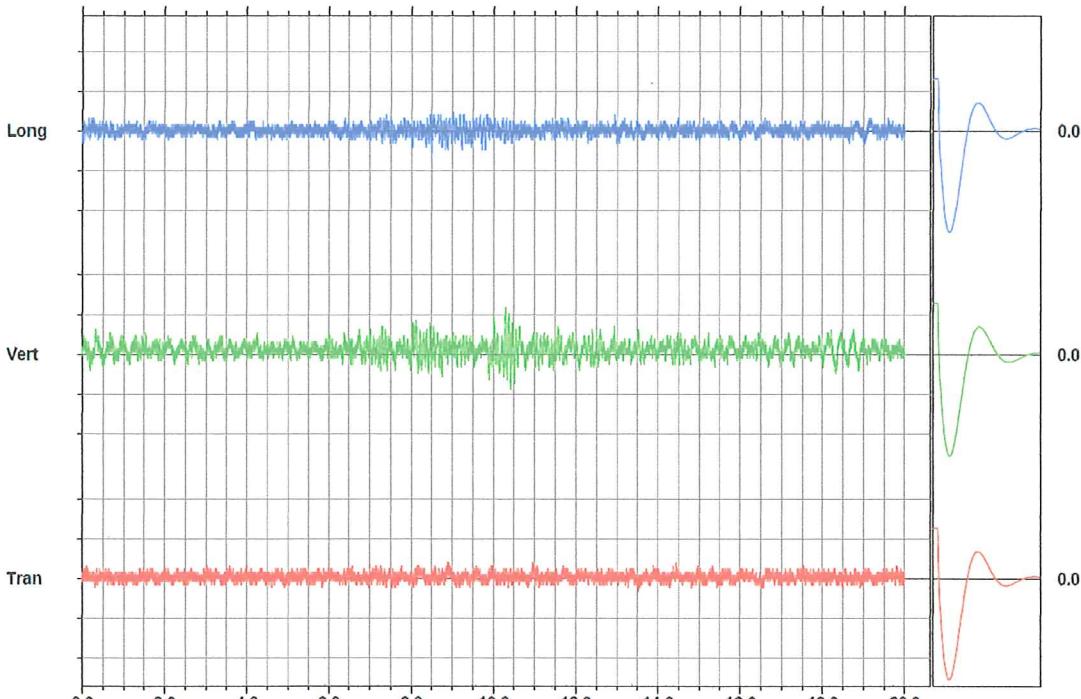
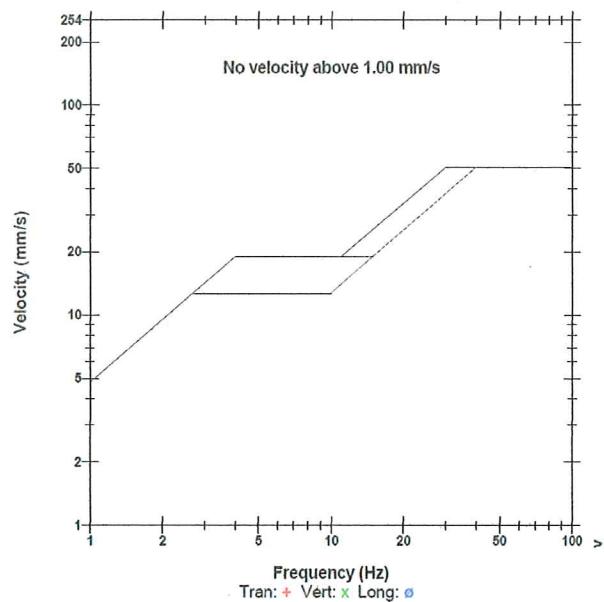
**Extended Notes**

	Tran	Vert	Long	
PPV	0.0794	0.238	0.111	mm/s
PPV	29.0	38.5	31.9	dB
ZC Freq	47	11	18	Hz
Time (Rel. to Trig)	8.898	10.292	8.495	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00065	0.00525	0.00108	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.8	Hz
Overswing Ratio	3.8	3.7	3.6	

Peak Vector Sum 0.245 mm/s at 10.292 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name A Q579I637.N10

**USBM RI8507 And OSMRE**



Sensor Check



## Event Report

Date/Time Manual at 12:04:18 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

**Notes**  
 Location: SITIO 5 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIOS

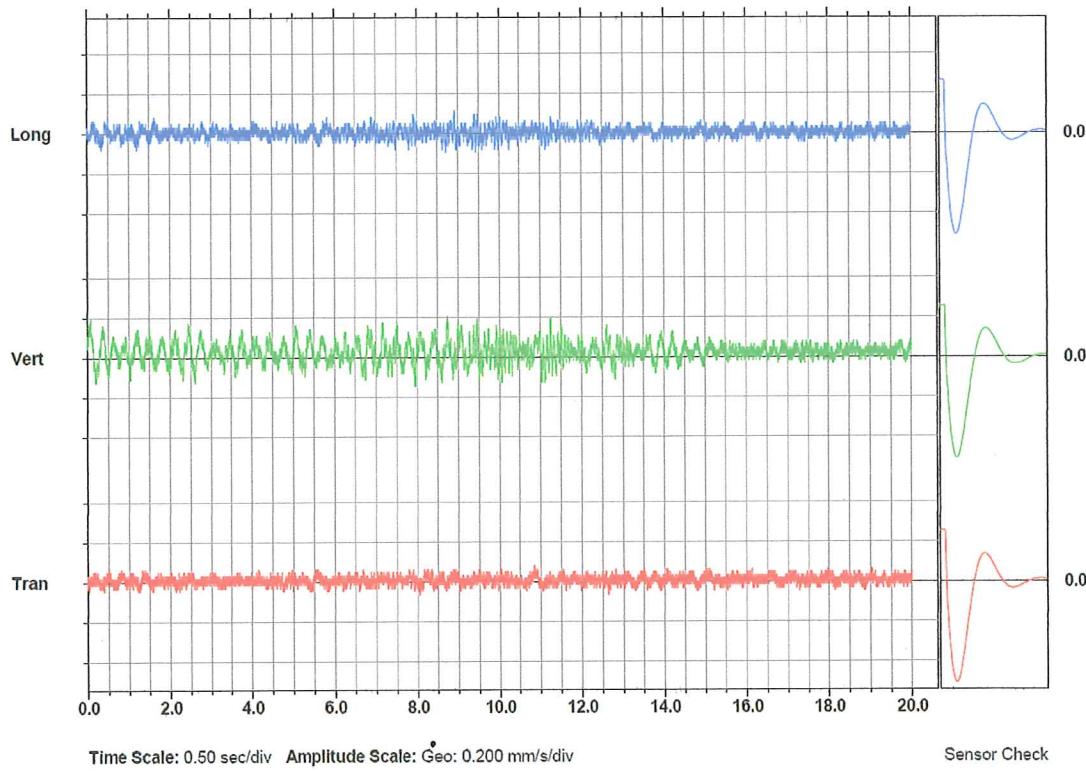
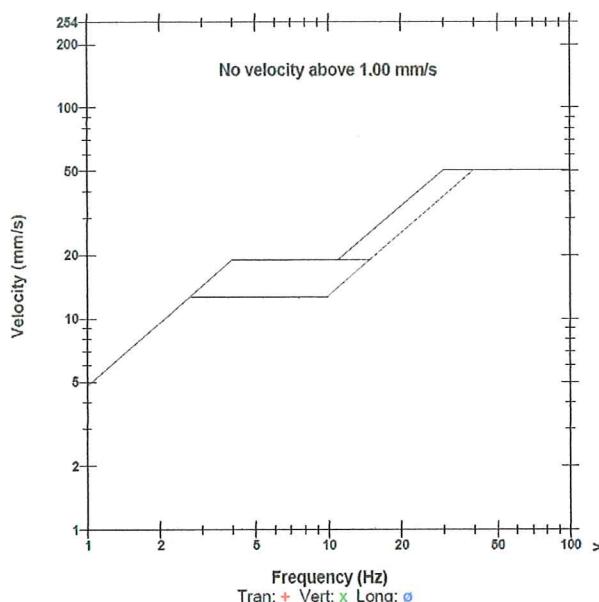
**Extended Notes**

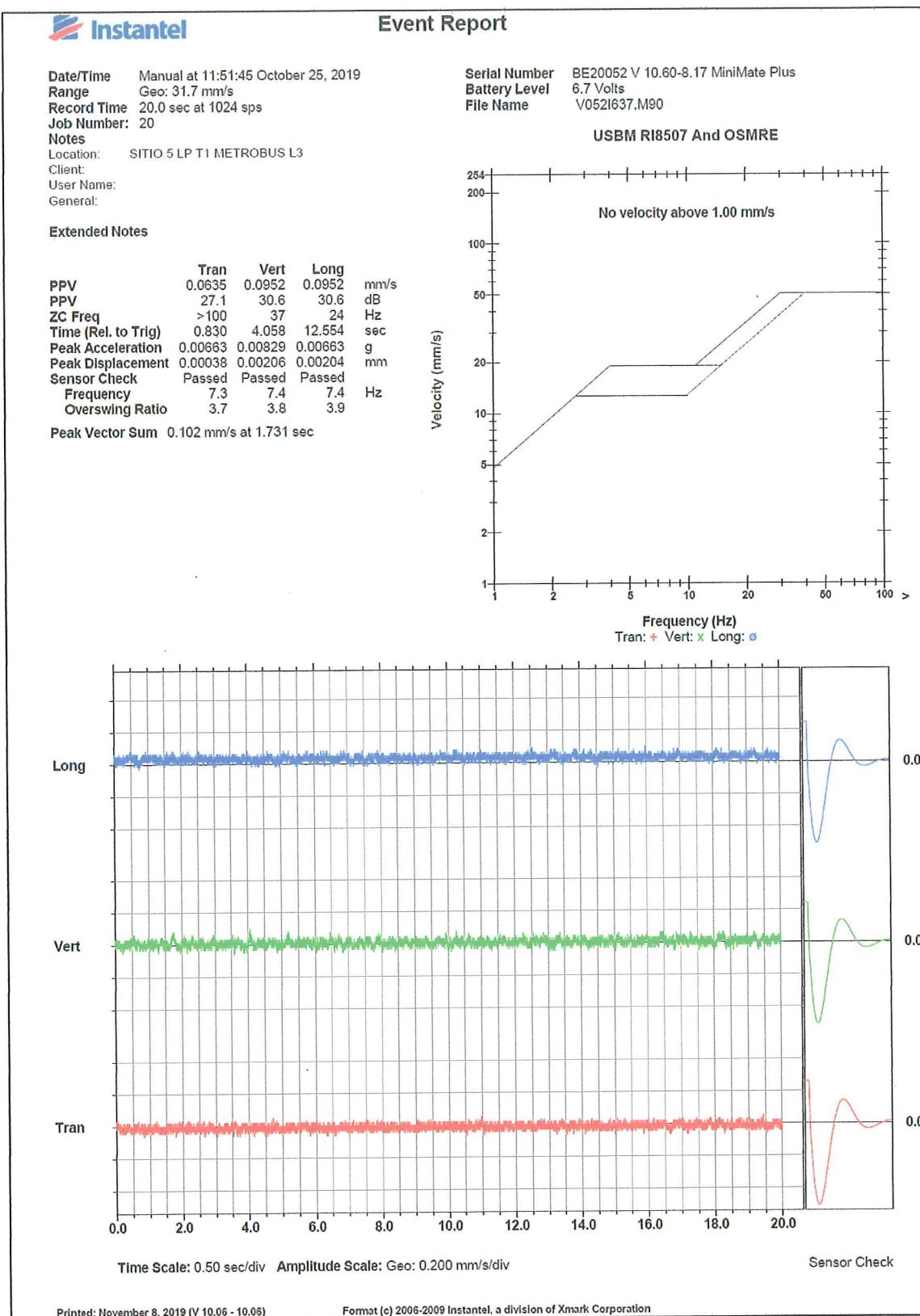
	Tran	Vert	Long	
PPV	0.0794	0.206	0.111	mm/s
PPV	29.0	37.3	31.9	dB
ZC Freq	28	6.0	13	Hz
Time (Rel. to Trig)	10.832	8.737	8.923	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00054	0.00807	0.00127	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.5	7.7	Hz
Overswing Ratio	3.8	3.7	3.6	

Peak Vector Sum 0.208 mm/s at 8.737 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q5791638.760

**USBM R18507 And OSMRE**







### Event Report

Date/Time Manual at 12:03:46 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 22

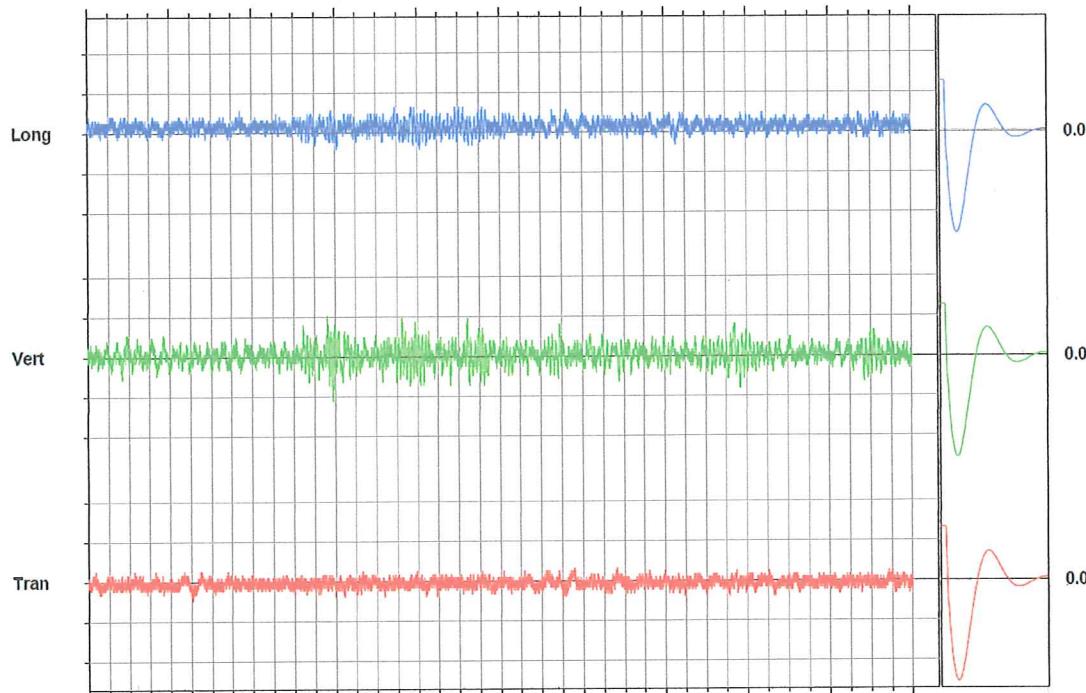
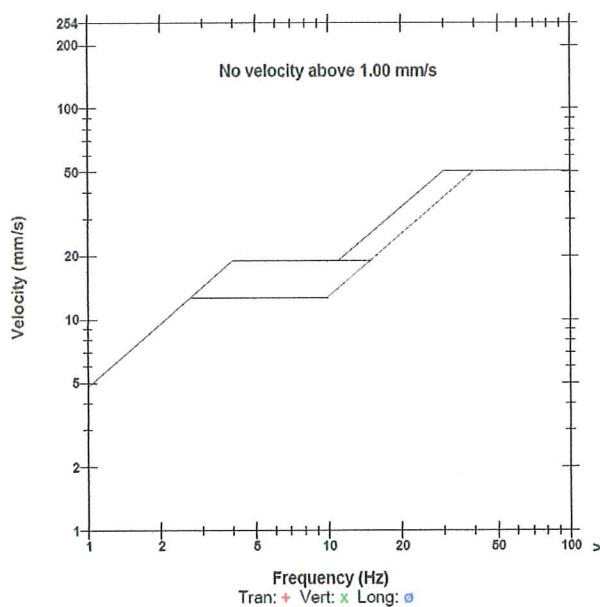
Notes  
 Location: SITIO 5 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.222	0.127	mm/s
PPV	30.6	37.9	33.1	dB
ZC Freq	8.3	12	13	Hz
Time (Rel. to Trig)	2.533	5.949	7.456	sec
Peak Acceleration	0.00829	0.00829	0.00829	g
Peak Displacement	0.00151	0.00328	0.00395	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.7	3.7	3.9	
Peak Vector Sum	0.225 mm/s at 5.949 sec			

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I638.6AO

#### USBM RI8507 And OSMRE



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check



**Event Report**

Date/Time Manual at 12:24:00 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 6 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO6

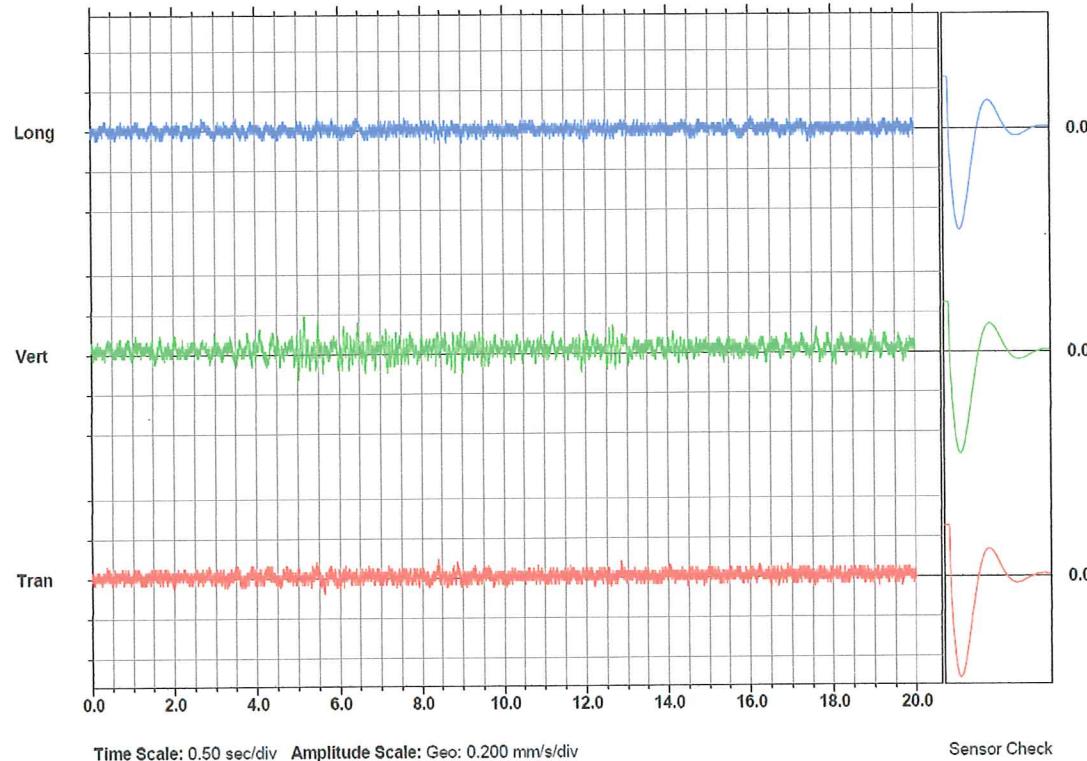
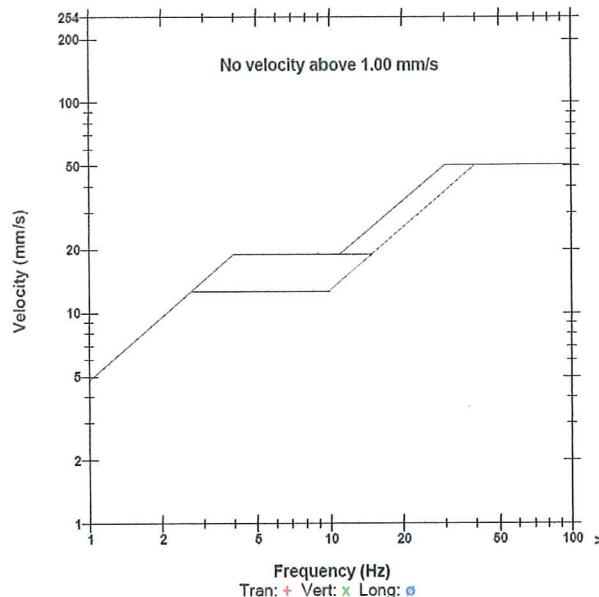
Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.190	0.0635	mm/s
PPV	30.6	36.6	27.1	dB
ZC Freq	18	8.5	>100	Hz
Time (Rel. to Trig)	8.399	5.162	2.708	sec
Peak Acceleration	0.00663	0.00663	0.00663	g
Peak Displacement	0.00095	0.00488	0.00068	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.5	7.7	Hz
Overswing Ratio	3.8	3.7	3.6	

Peak Vector Sum 0.194 mm/s at 5.166 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I639.400

**USBM RI8507 And OSMRE**





## Event Report

Date/Time Manual at 12:36:32 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps

Job Number: 1

**Notes**

Location: SITIO 6 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO6

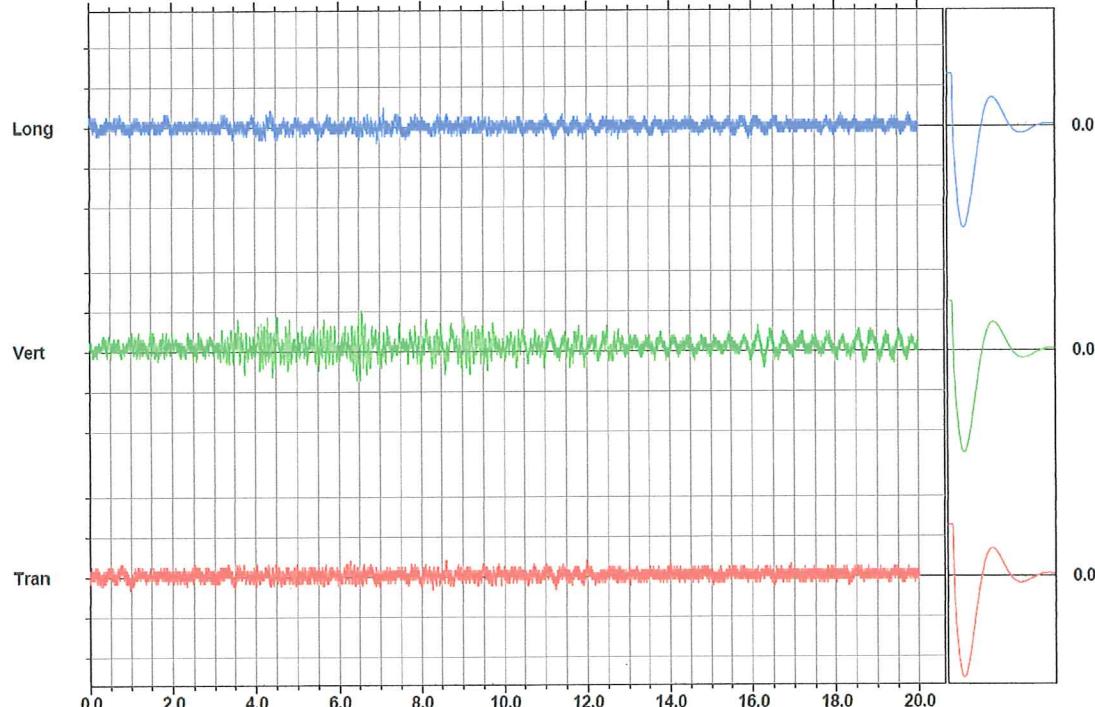
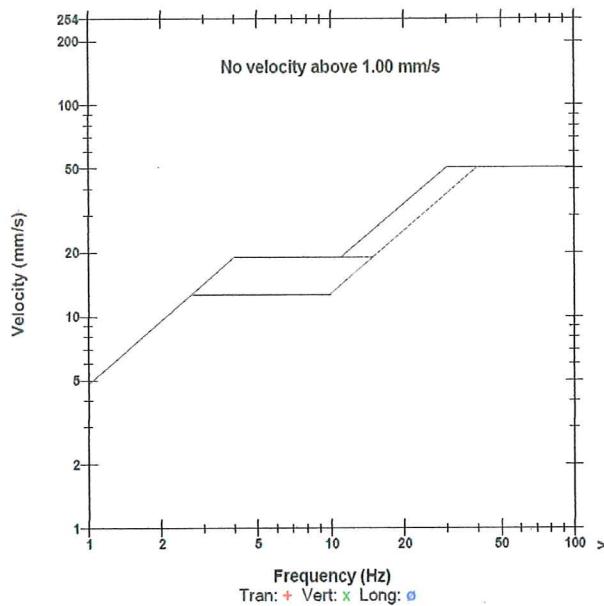
**Extended Notes**

	Tran	Vert	Long	
PPV	0.0794	0.206	0.0952	mm/s
PPV	29.0	37.3	30.6	dB
ZC Freq	17	9.8	20	Hz
Time (Rel. to Trig)	6.270	6.567	7.102	sec
Peak Acceleration	0.00663	0.00863	0.00663	g
Peak Displacement	0.00088	0.00595	0.00108	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.7	Hz
Overswing Ratio	3.8	3.7	3.7	

Peak Vector Sum 0.207 mm/s at 6.567 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I639.OW0

### USBM RI8507 And OSMRE



Sensor Check



**Event Report**

Date/Time Manual at 12:23:26 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 21

Notes  
 Location: SITIO 6 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

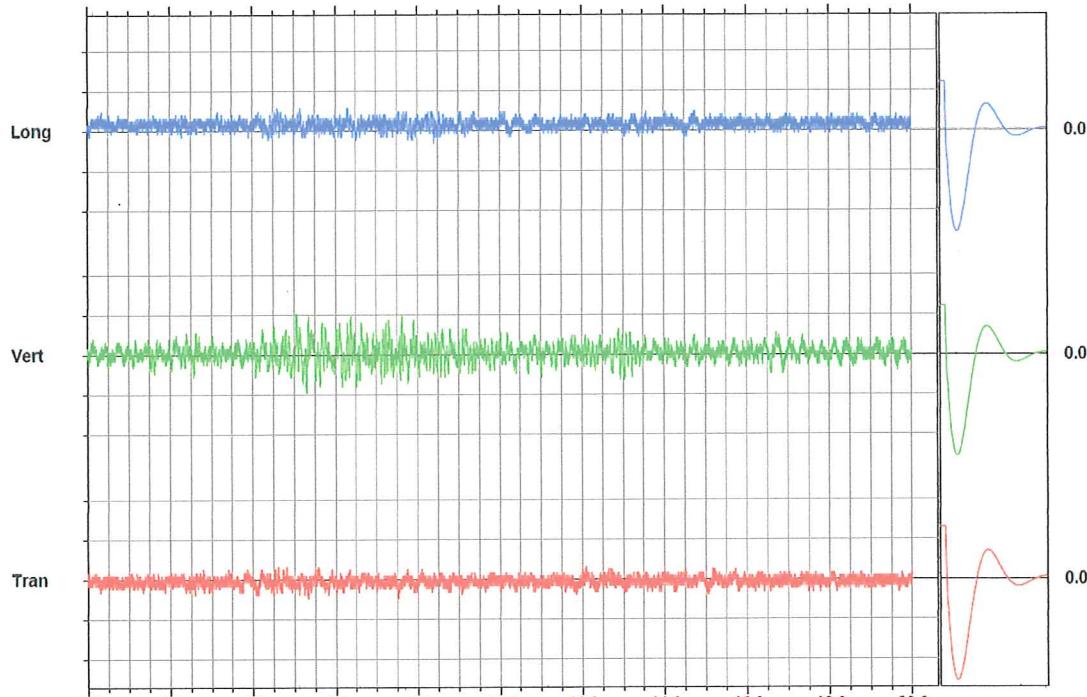
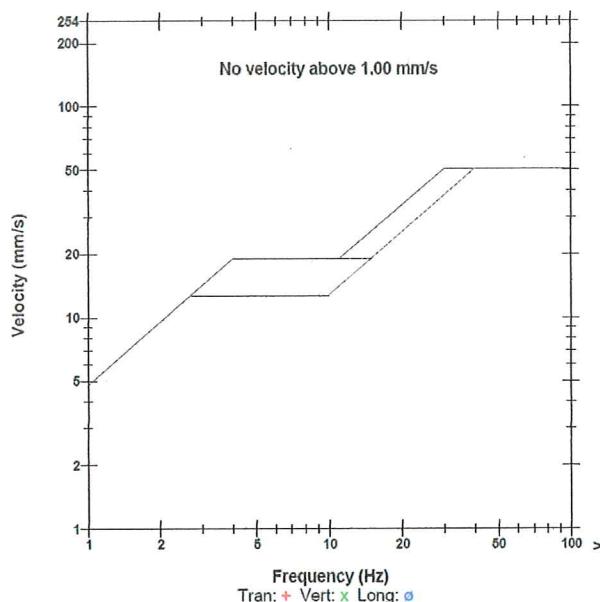
Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.206	0.111	mm/s
PPV	30.6	37.3	31.9	dB
ZC Freq	13	8.8	11	Hz
Time (Rel. to Trig)	5.328	5.057	4.613	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00141	0.00357	0.00304	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.4	7.4	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.212 mm/s at 5.057 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I639.320

**USBM RI8507 And OSMRE**



Sensor Check



### Event Report

Date/Time Manual at 12:35:57 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 21

Notes  
 Location: SITIO 6 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

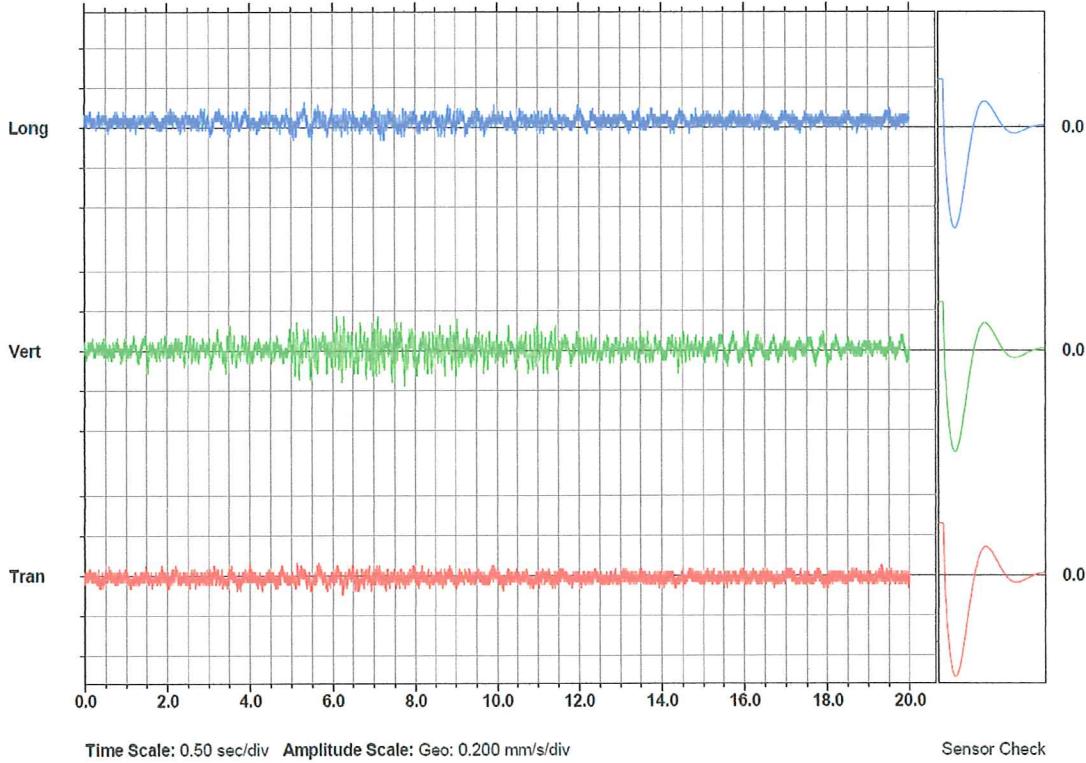
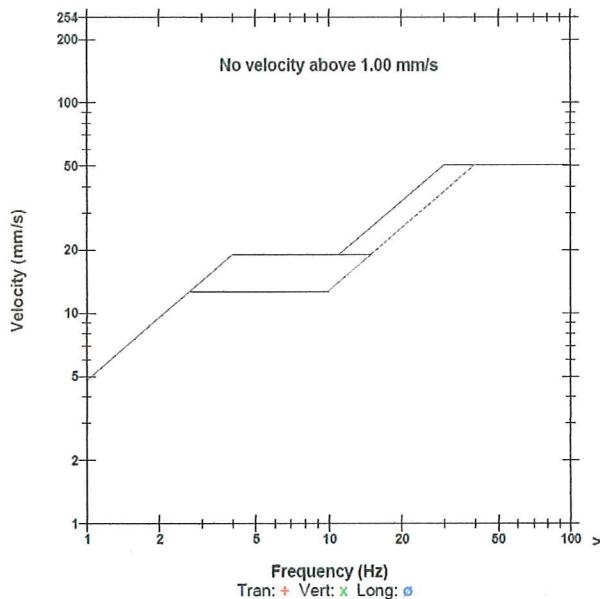
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.175	0.127	mm/s
PPV	30.6	35.8	33.1	dB
ZC Freq	10	9.8	3.0	Hz
Time (Rel. to Trig)	6.245	6.104	5.332	sec
Peak Acceleration	0.00829	0.00829	0.00663	g
Peak Displacement	0.00164	0.00255	0.00530	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.194 mm/s at 6.270 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I639.NX0

#### USBM RI8507 And OSMRE





### Event Report

Date/Time Manual at 12:53:02 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 7 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: 7

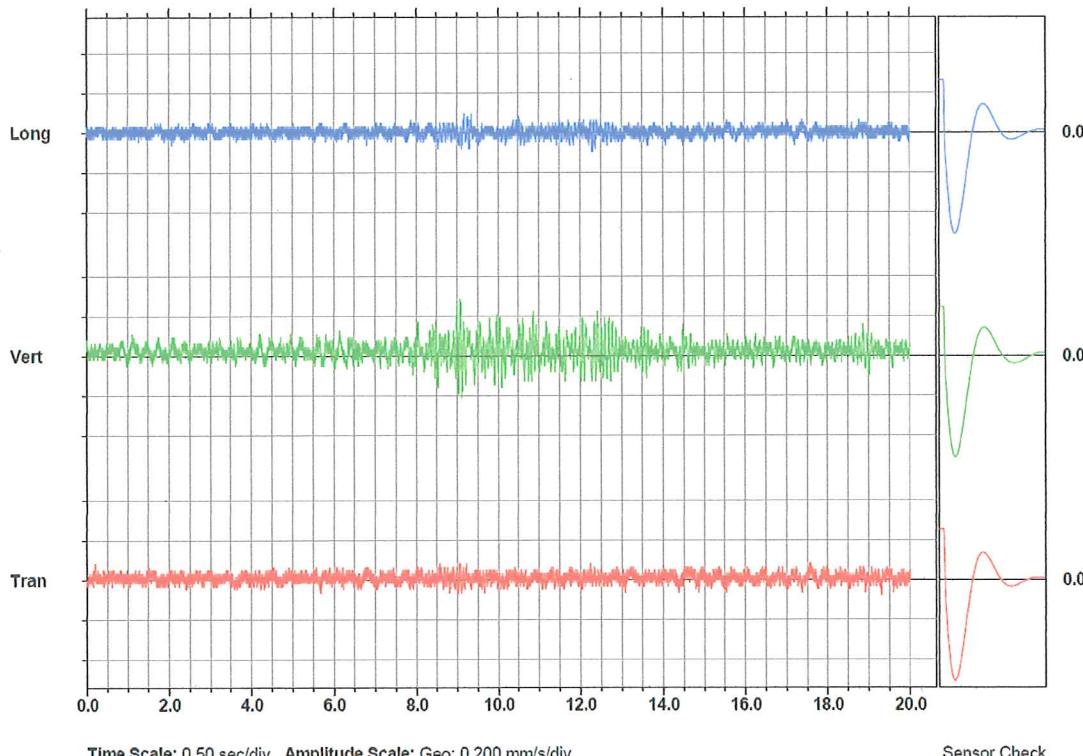
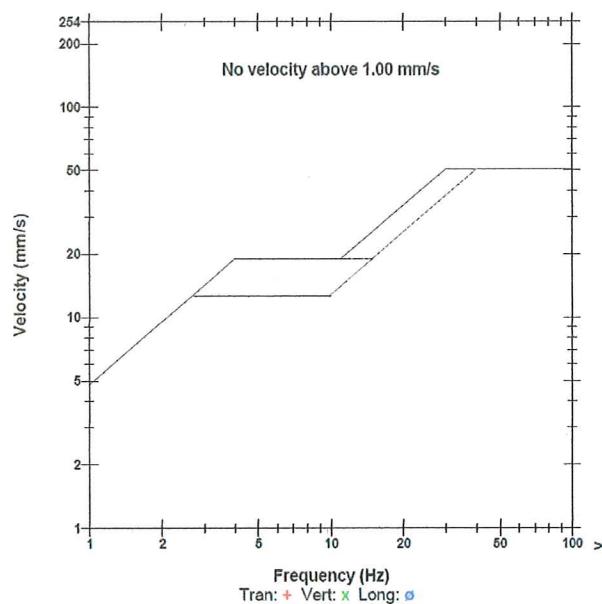
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.286	0.0952	mm/s
PPV	29.0	40.1	30.6	dB
ZC Freq	47	11	23	Hz
Time (Rel. to Trig)	0.191	9.084	9.166	sec
Peak Acceleration	0.00829	0.00663	0.00829	g
Peak Displacement	0.00124	0.00432	0.00092	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.7	Hz
Overswing Ratio	3.8	3.6	3.6	

Peak Vector Sum 0.289 mm/s at 9.064 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I63A.GE0

#### USBM RI8507 And OSMRE



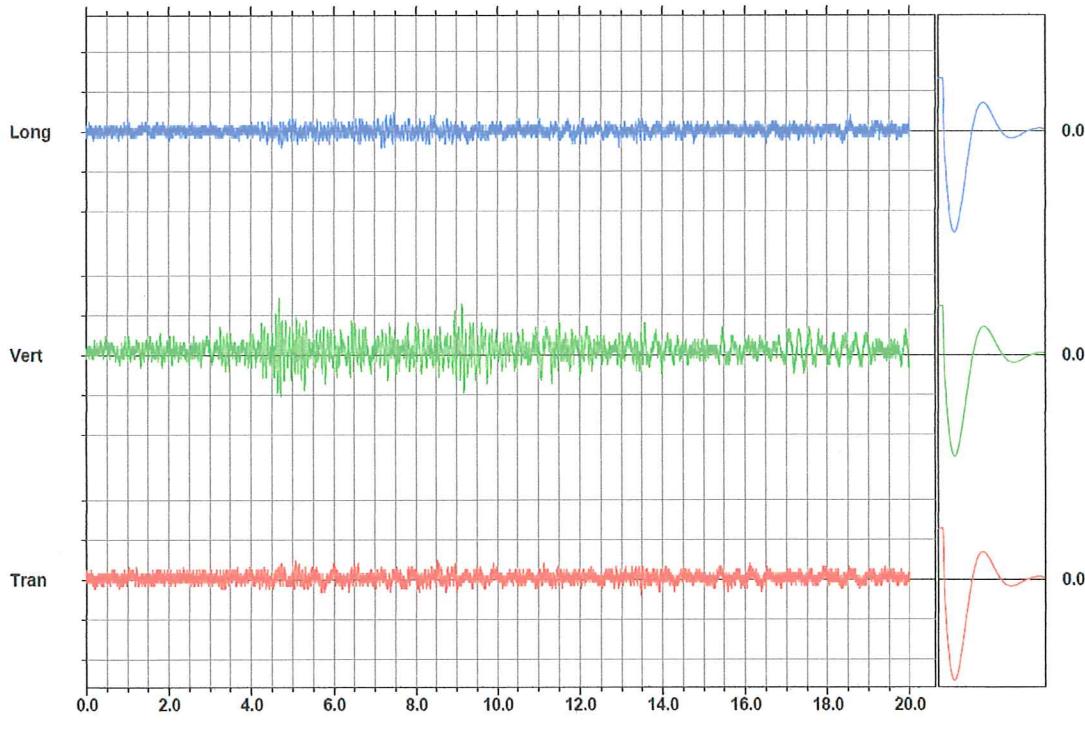
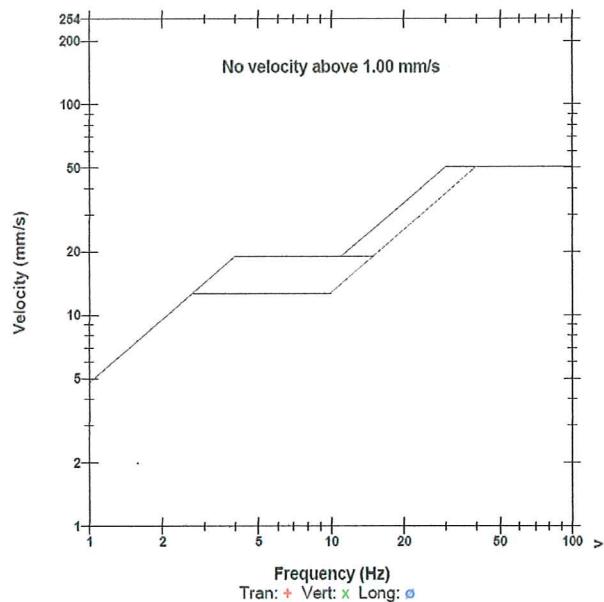


### Event Report

Date/Time Manual at 13:07:04 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1  
**Notes**  
 Location: SITIO 7 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIOT

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I63B.3S0

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 132:5:28 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 23

Notes  
 Location: SITIO 7 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

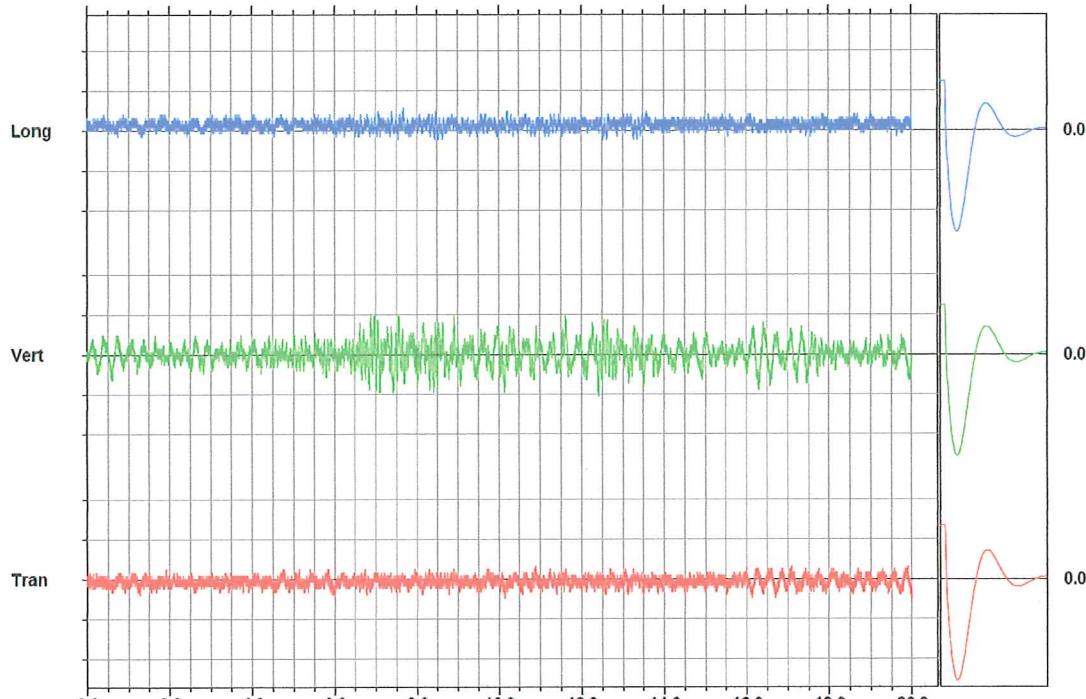
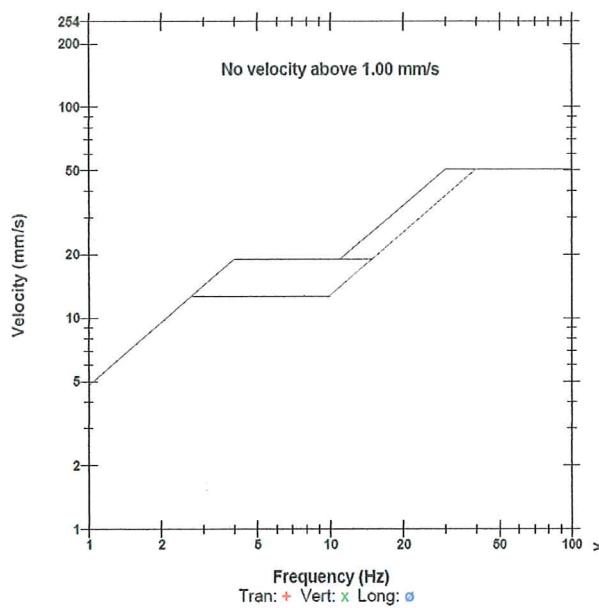
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.204	0.110	mm/s
PPV	30.6	37.3	31.9	dB
ZC Freq	10	8.7	11	Hz
Time (Rel. to Trig)	10.144	12.416	7.683	sec
Peak Acceleration	0.00829	0.00863	0.00663	g
Peak Displacement	0.00243	0.00597	0.00211	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.211 mm/s at 12.416 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052163B.YG0

#### USBM RI8507 And OSMRE



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check



### Event Report

Date/Time Manual at 13:07:38 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 23

**Notes**  
 Location: SITIO 7 LP T2METROBUS L3  
 Client:  
 User Name:  
 General:

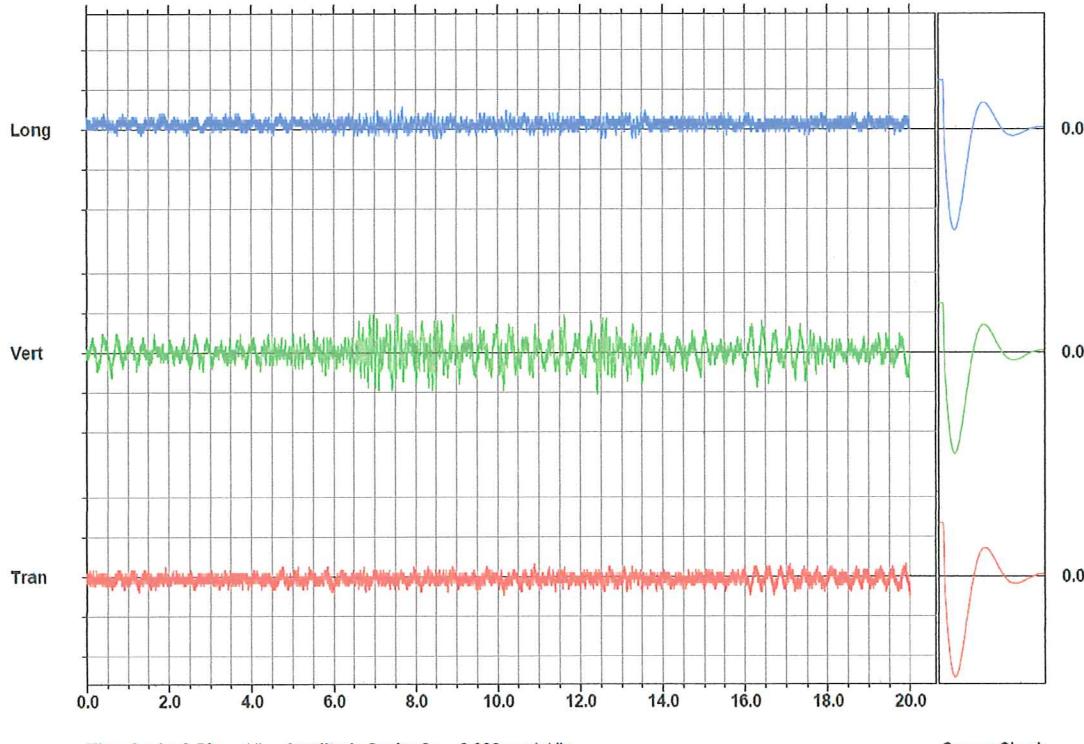
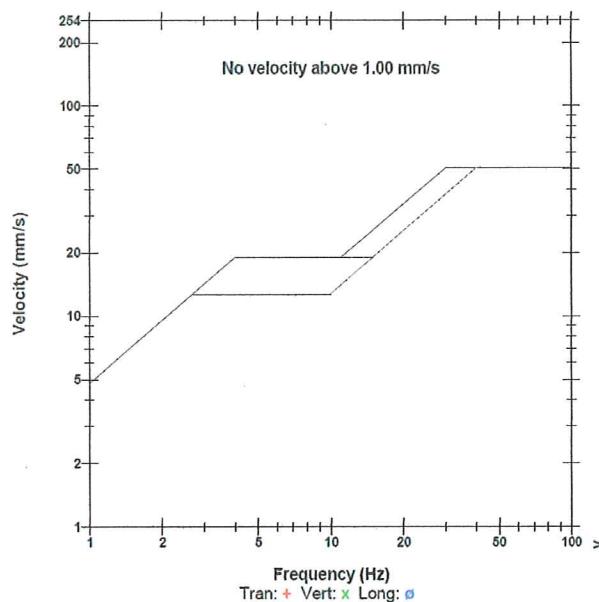
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.206	0.111	mm/s
PPV	30.6	37.3	31.9	dB
ZC Freq	10	8.7	11	Hz
Time (Rel. to Trig)	10.144	12.416	7.683	sec
Peak Acceleration	0.00829	0.00663	0.00663	g
Peak Displacement	0.00243	0.00597	0.00211	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.211 mm/s at 12.416 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052163BB.YG0

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 13:35:07 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

**Notes**  
 Location: SITIO 8 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO8

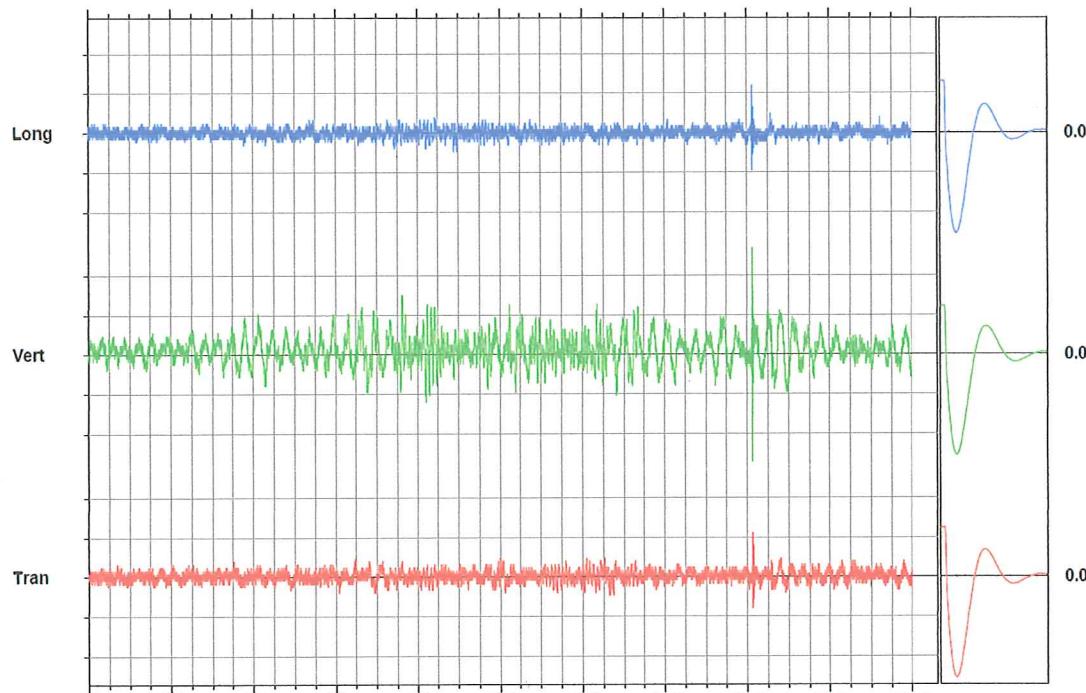
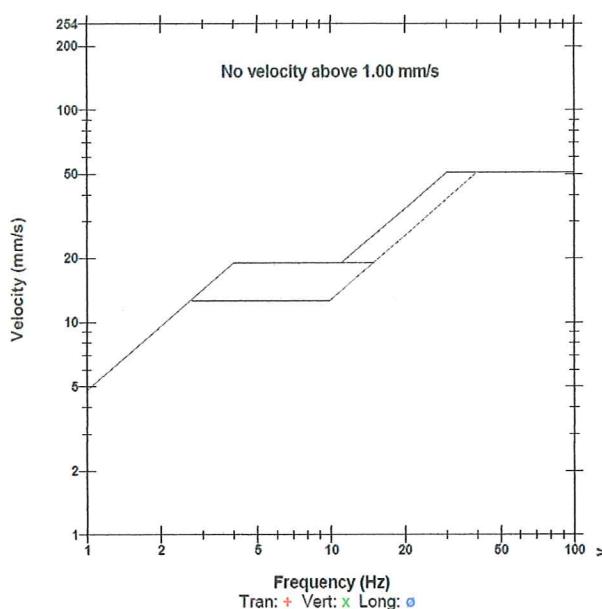
#### Extended Notes

	Tran	Vert	Long	
PPV	0.222	0.984	0.238	mm/s
PPV	37.9	50.9	38.5	dB
ZC Freq	>100	>100	85	Hz
Time (Rel. to Trig)	16.135	16.125	16.128	sec
Peak Acceleration	0.0232	0.0928	0.0199	g
Peak Displacement	0.00209	0.0117	0.00092	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.7	Hz
Overswing Ratio	3.8	3.6	3.6	

Peak Vector Sum 0.993 mm/s at 16.125 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I63C.EJ0

#### USBM RI8507 And OSMRE



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check



### Event Report

Date/Time Manual at 13:49:15 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

**Notes**  
 Location: SITIO 8 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO8

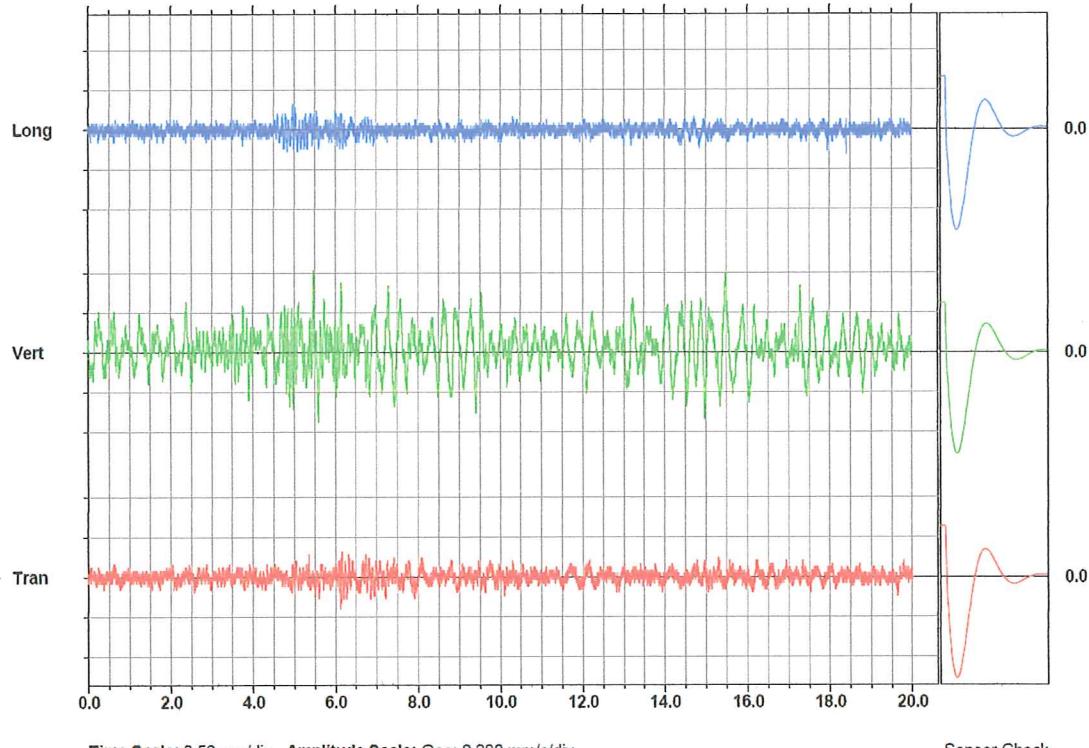
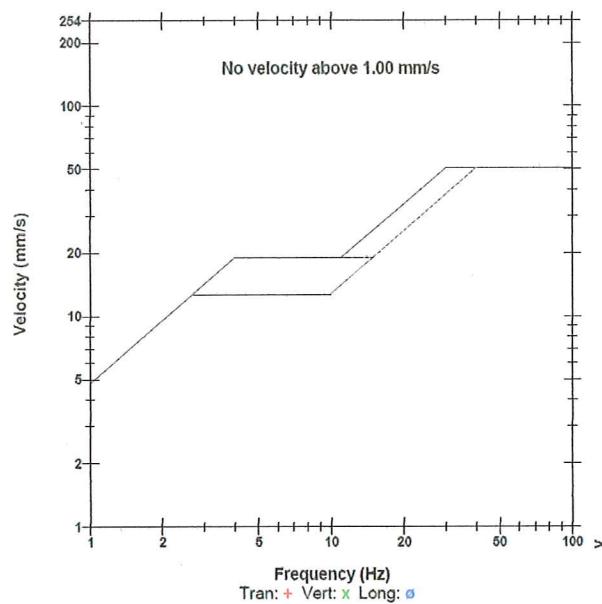
#### Extended Notes

	Tran	Vert	Long	
PPV	0.159	0.413	0.127	mm/s
PPV	35.0	43.3	33.1	dB
ZC Freq	12	9.5	16	Hz
Time (Rel. to Trig)	6.124	5.467	4.955	sec
Peak Acceleration	0.00663	0.00663	0.00829	g
Peak Displacement	0.00205	0.0171	0.00164	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.5	7.7	Hz
Overswing Ratio	3.7	3.6	3.6	

Peak Vector Sum 0.415 mm/s at 5.467 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I63D.230

#### USBM RI8507 And OSMRE





### Event Report

Date/Time Manual at 13:25:28 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 23

**Notes**  
 Location: SITIO 8 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

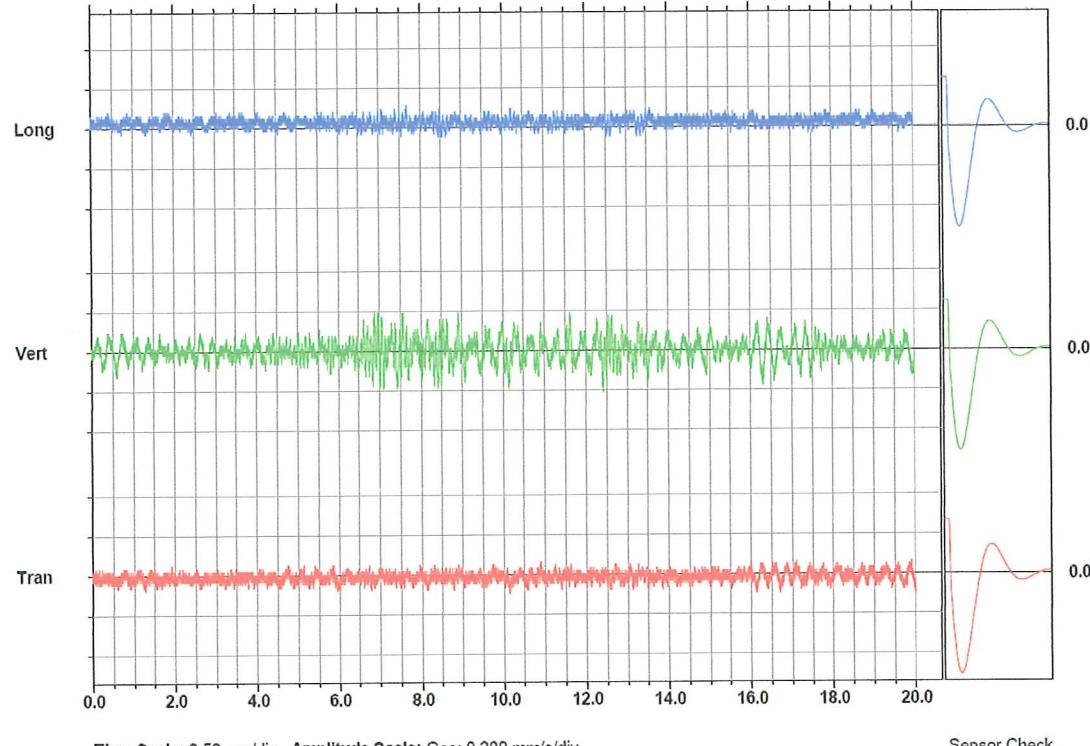
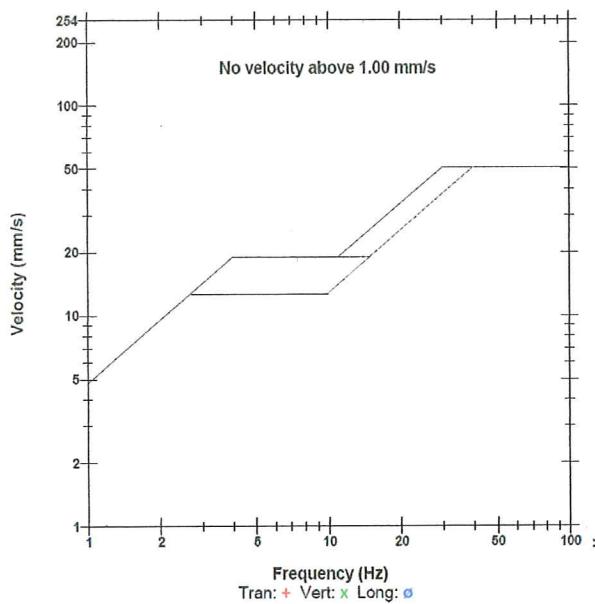
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.206	0.111	mm/s
PPV	30.6	37.3	31.9	dB
ZC Freq	10	8.7	11	Hz
Time (Rel. to Trig)	10.144	12.416	7.683	sec
Peak Acceleration	0.00829	0.00663	0.00663	g
Peak Displacement	0.00243	0.00597	0.00211	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.3	7.5	7.5	
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.211 mm/s at 12.416 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I63B.YG0

#### USBM RI8507 And OSMRE



Sensor Check

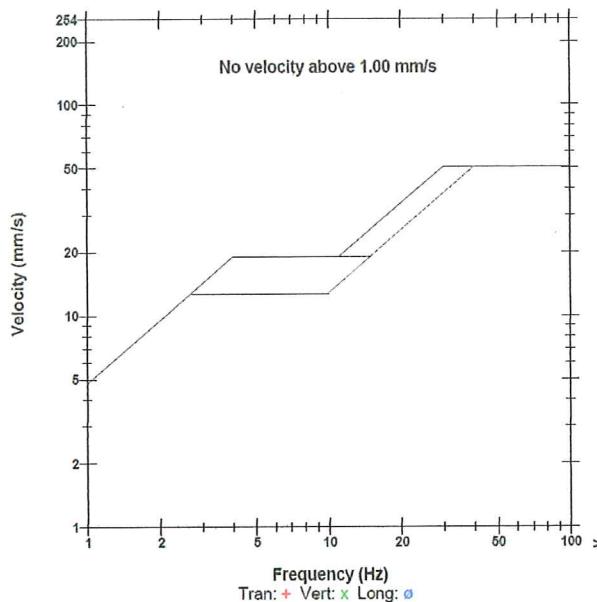


### Event Report

Date/Time Manual at 13:39:34 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 23  
 Notes  
 Location: SITIO 8 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

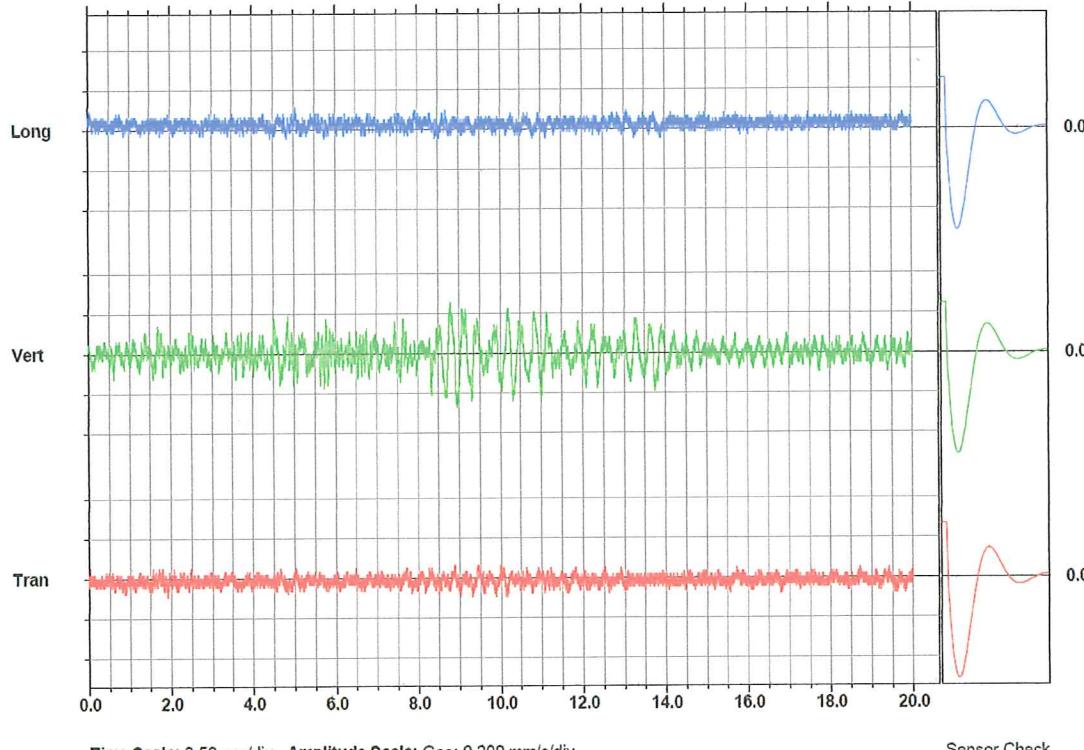
Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.6 Volts  
 File Name V052I63C.LY0

#### USBM RI8507 And OSMRE



PPV 0.0952 0.270 0.111 mm/s  
 PPV 30.6 39.6 31.9 dB  
 ZC Freq 13 3.8 13 Hz  
 Time (Rel. to Trig) 1.920 8.948 5.049 sec  
 Peak Acceleration 0.00829 0.00829 0.00829  
 Peak Displacement 0.00246 0.0114 0.00243  
 Sensor Check Passed Passed Passed  
 Frequency 7.3 7.4 7.4 Hz  
 Overswing Ratio 3.6 3.7 3.8

Peak Vector Sum 0.272 mm/s at 8.948 sec



Sensor Check

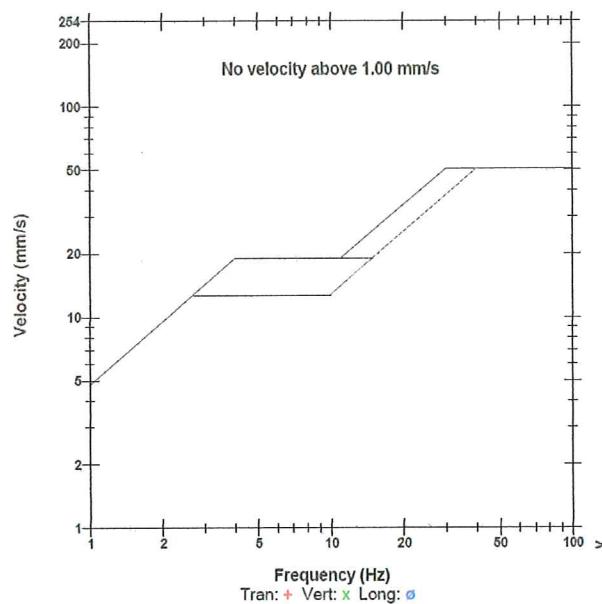


### Event Report

Date/Time Manual at 13:54:08 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1  
**Notes**  
 Location: SITIO 9 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO9

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I63D.A80

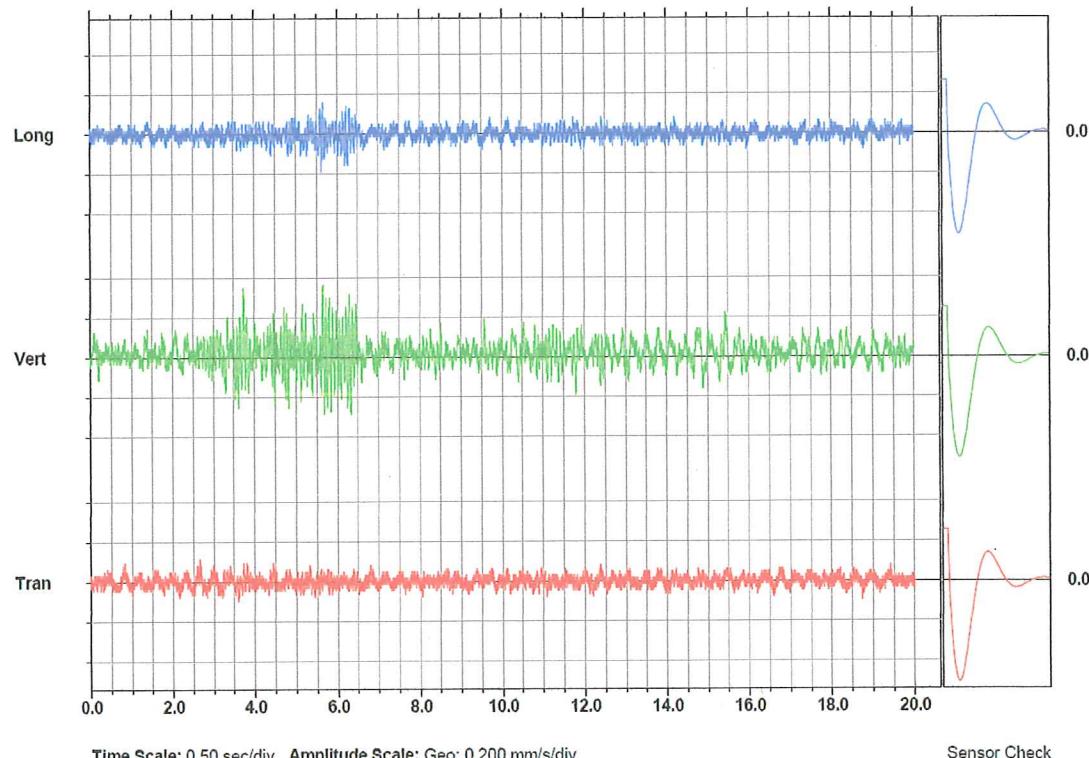
#### USBM RI8507 And OSMRE



#### Extended Notes

	Tran	Vert	Long	mm/s
PPV	0.111	0.365	0.190	mm/s
PPV	31.9	42.2	36.6	dB
ZC Freq	14	12	14	Hz
Time (Rel. to Trig)	2.661	5.652	5.626	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00102	0.00775	0.00205	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.8	Hz
Overswing Ratio	3.7	3.6	3.6	

Peak Vector Sum 0.382 mm/s at 5.652 sec





### Event Report

Date/Time Manual at 14:04:46 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

**Notes**  
 Location: SITIO 9 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO9

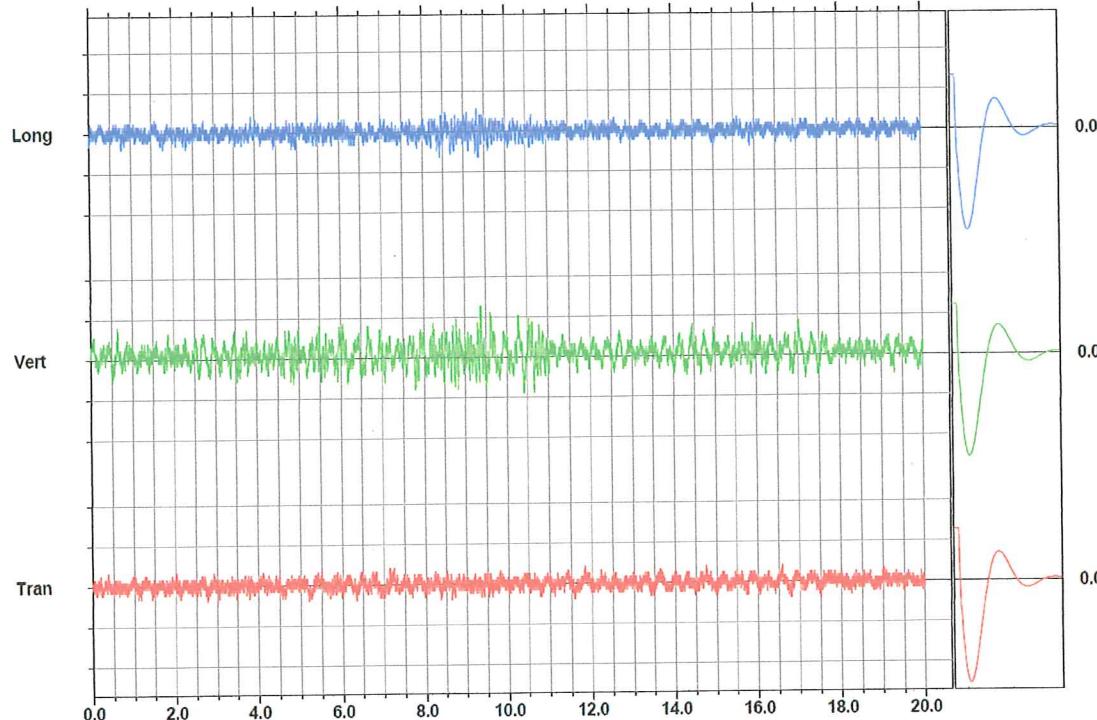
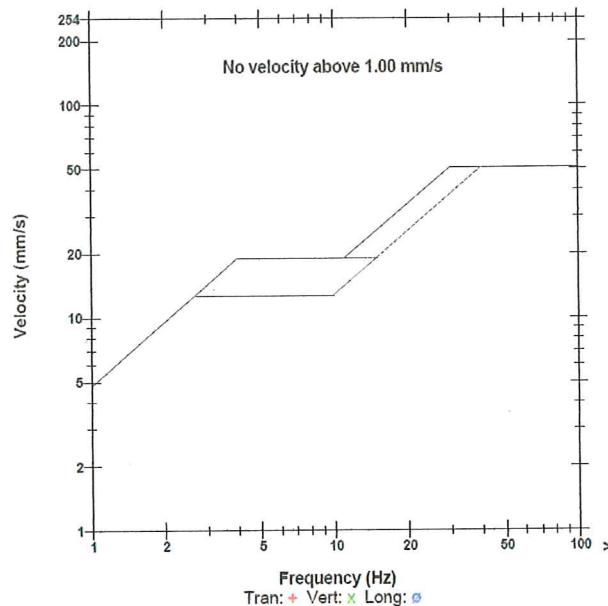
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.254	0.127	mm/s
PPV	29.0	39.1	33.1	dB
ZC Freq	73	10	13	Hz
Time (Rel. to Trig)	2.772	9.380	8.422	sec
Peak Acceleration	0.00829	0.00663	0.00663	g
Peak Displacement	0.00091	0.00509	0.00166	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.8	7.6	7.8	
Overswing Ratio	3.7	3.6	3.6	

Peak Vector Sum 0.256 mm/s at 9.380 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I63D.RY0

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 13:54:33 October 25, 2019  
 Range Geo: 31.7 mm/s

Record Time 20.0 sec at 1024 sps

Job Number: 24

**Notes**

Location: SITIO 9 LP T1 METROBUS L3

Client:

User Name:

General:

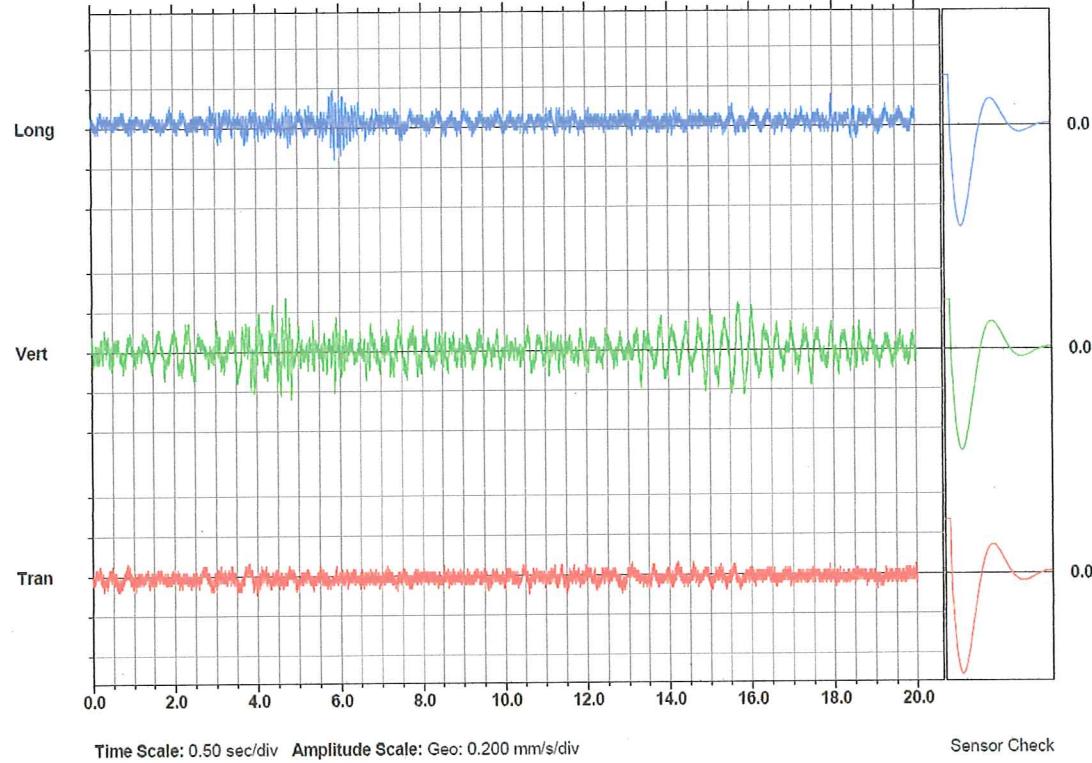
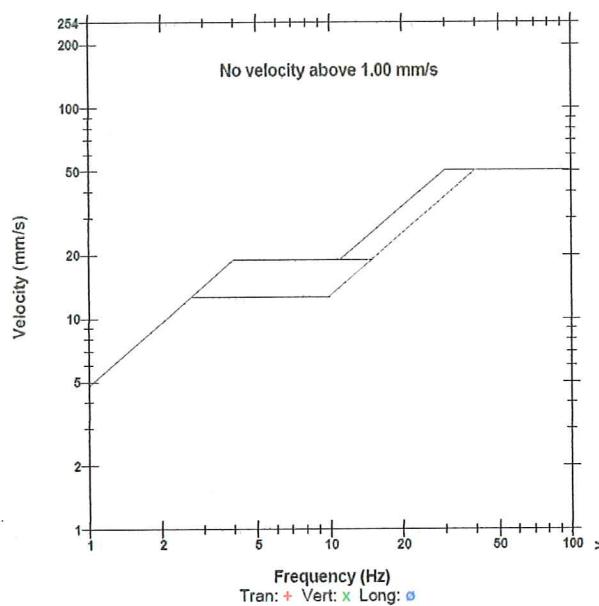
**Extended Notes**

	Tran	Vert	Long	
PPV	0.0952	0.270	0.190	mm/s
PPV	30.6	39.6	36.6	dB
ZC Freq	9.3	9.5	10	Hz
Time (Rel. to Trig)	3.962	4.705	5.854	sec
Peak Acceleration	0.00829	0.00829	0.00829	g
Peak Displacement	0.00253	0.0103	0.00312	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.3	7.5	7.5	
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.272 mm/s at 4.705 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I63D.AX0

### USBM RI8507 And OSMRE





### Event Report

Date/Time Manual at 14:05:11 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 24

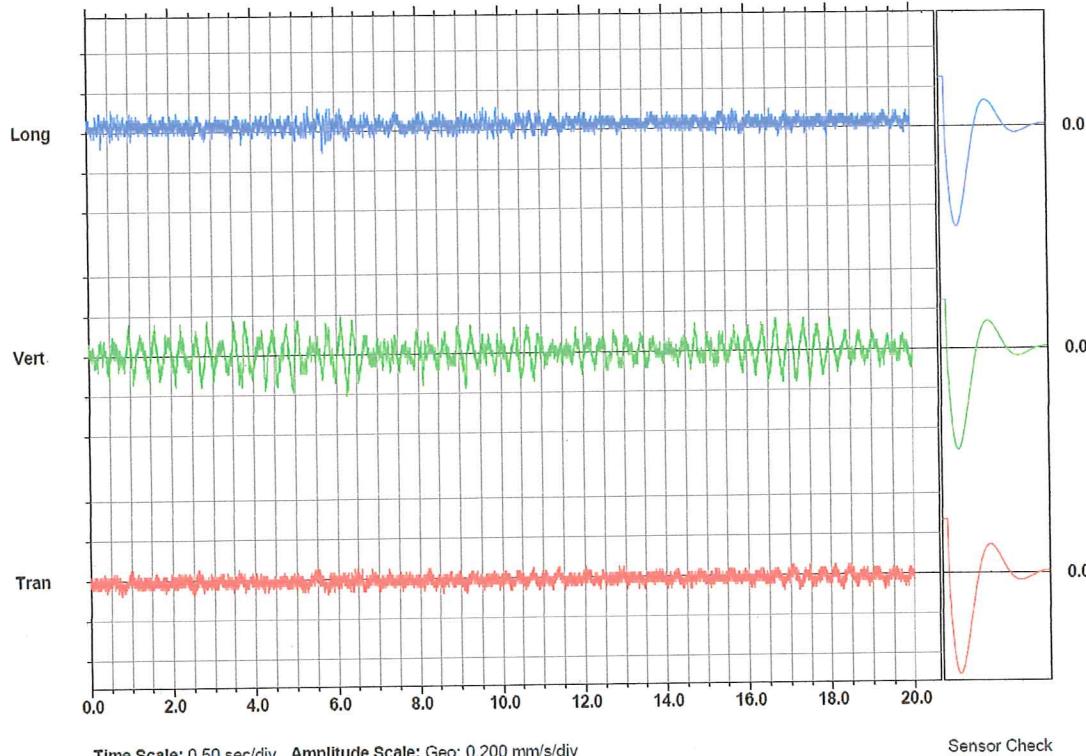
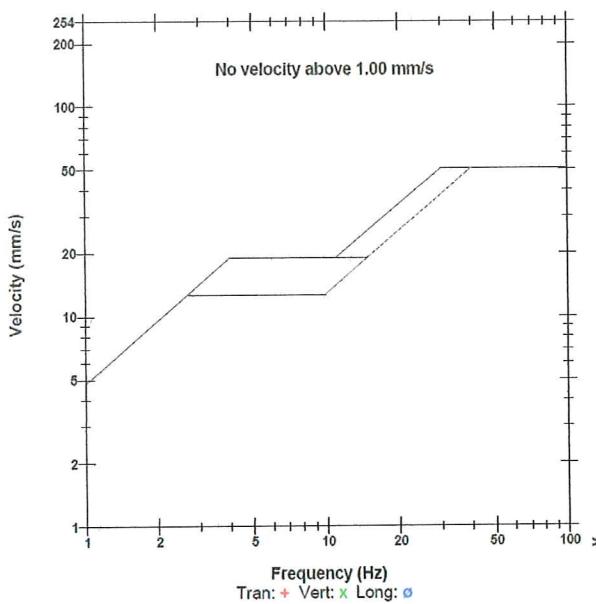
**Notes**  
 Location: SITIO 9 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.206	0.127	mm/s
PPV	29.0	37.3	33.1	dB
ZC Freq	37	4.6	12	Hz
Time (Rel. to Trig)	0.759	6.256	5.374	sec
Peak Acceleration	0.00829	0.00663	0.00663	g
Peak Displacement	0.00156	0.00646	0.00432	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.2	7.4	7.4	
Overswing Ratio	3.7	3.7	3.9	
Peak Vector Sum	0.209 mm/s at 6.256 sec			

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052163.DSN0

#### USBM RI8507 And OSMRE





### Event Report

Date/Time Manual at 15:48:38 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 10 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO10

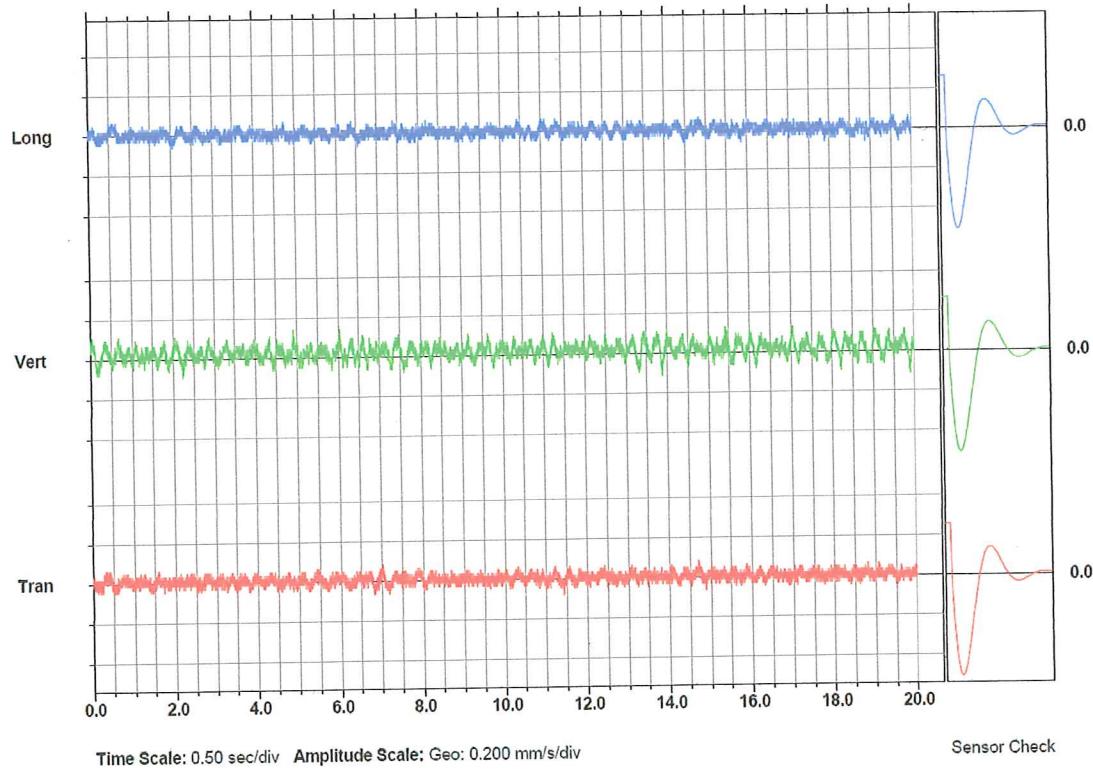
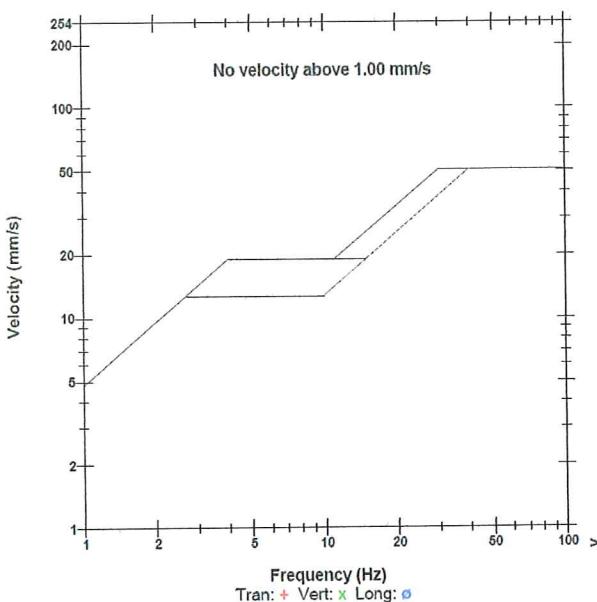
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.143	0.0635	mm/s
PPV	29.0	34.1	27.1	dB
ZC Freq	15	8.1	>100	Hz
Time (Rel. to Trig)	7.016	4.922	0.514	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00074	0.00568	0.00112	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.5	7.7	Hz
Overswing Ratio	3.7	3.6	3.6	

Peak Vector Sum 0.147 mm/s at 4.922 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579|631.L20

#### USBM RI8507 And OSMRE





### Event Report

Date/Time Manual at 16:14:46 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

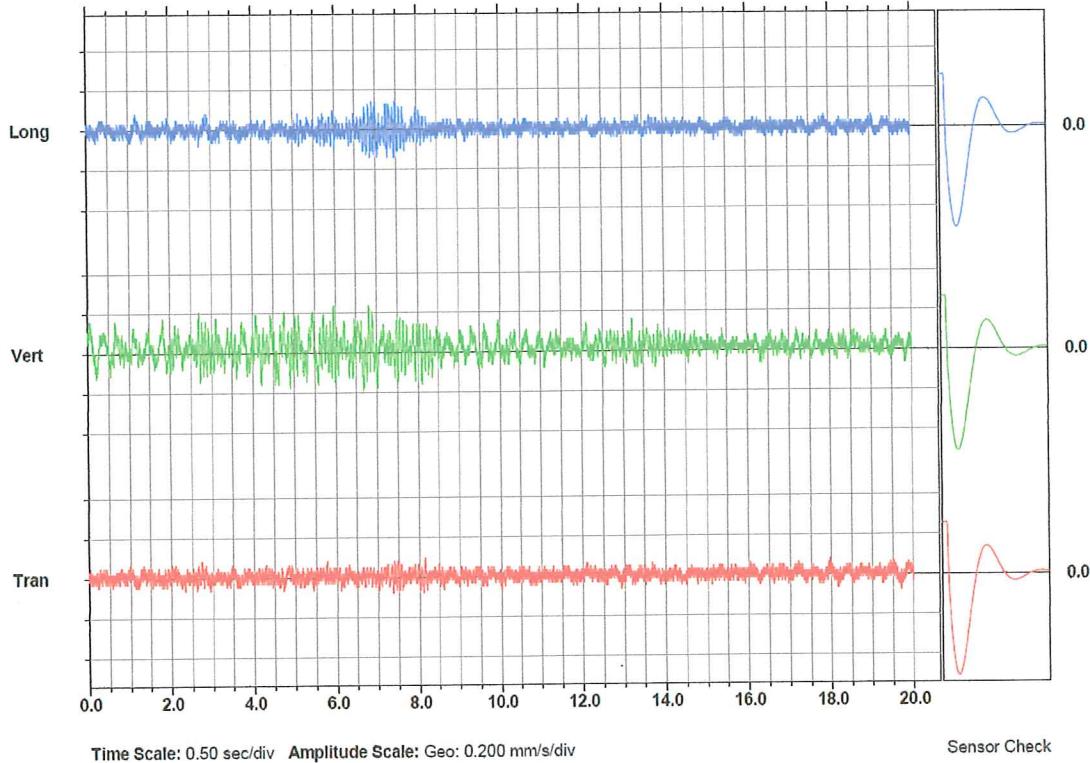
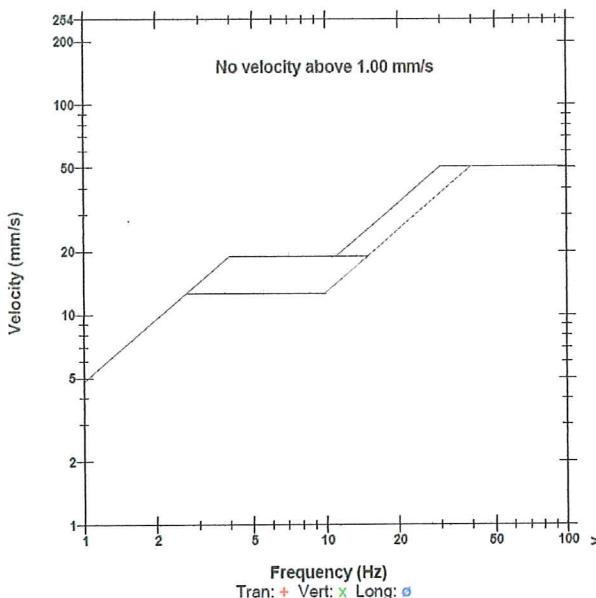
**Notes**  
 Location: MSITIO 10 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO10

#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.238	0.143	mm/s
PPV	30.6	38.5	34.1	dB
ZC Freq	17	11	14	Hz
Time (Rel. to Trig)	8.133	5.963	6.875	sec
Peak Acceleration	0.00663	0.00663	0.00663	g
Peak Displacement	0.00082	0.00672	0.00185	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.7	7.5	7.7	
Overswing Ratio	3.8	3.7	3.6	
Peak Vector Sum	0.246 mm/s at 5.963 sec			

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level U 6.7 Volts  
 File Name Q579I63J.SMO

#### USBM RI8507 And OSMRE





### Event Report

Date/Time Manual at 15:47:59 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 25

**Notes**  
 Location: SITIO 10 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

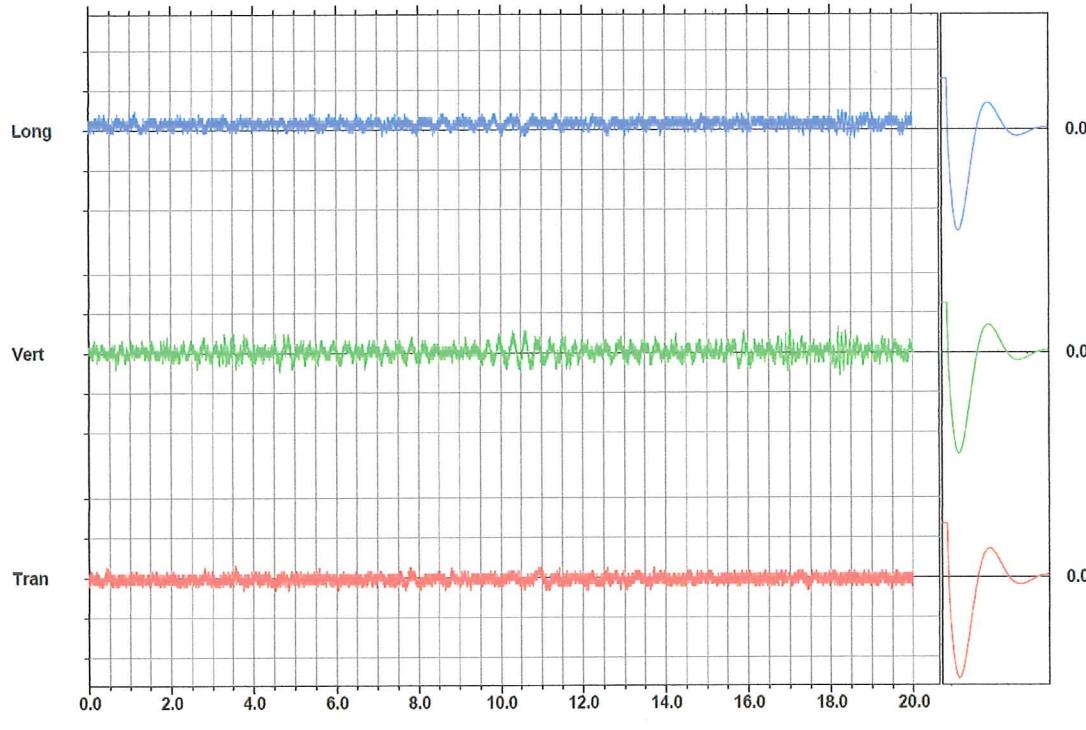
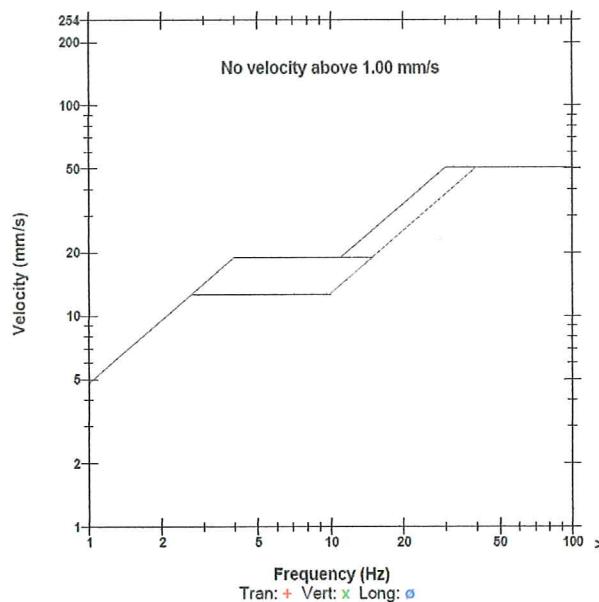
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0635	0.127	0.0952	mm/s
PPV	27.1	33.1	30.6	dB
ZC Freq	>100	9.8	>100	Hz
Time (Rel. to Trig)	3.560	17.017	1.147	sec
Peak Acceleration	0.00663	0.00663	0.00663	g
Peak Displacement	0.00047	0.00317	0.00331	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.5	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.139 mm/s at 17.017 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I63I.JZ0

#### USBM RI8507 And OSMRE



Sensor Check

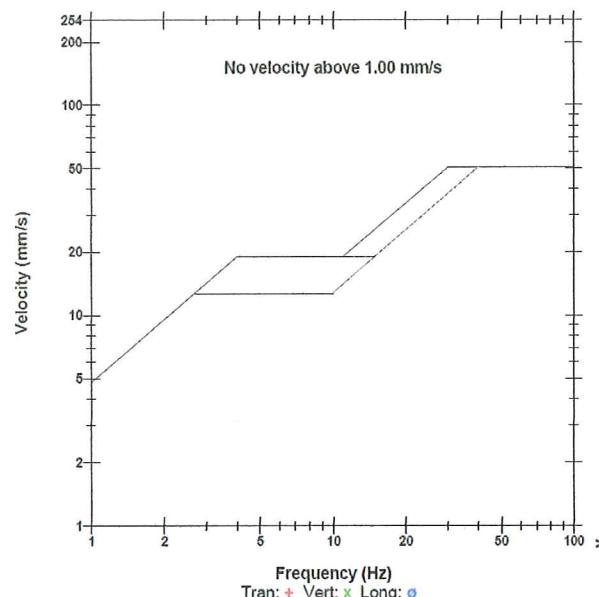


### Event Report

Date/Time Manual at 16:14:02 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 25  
 Notes  
 Location: SITIO 10 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052163J.RE0

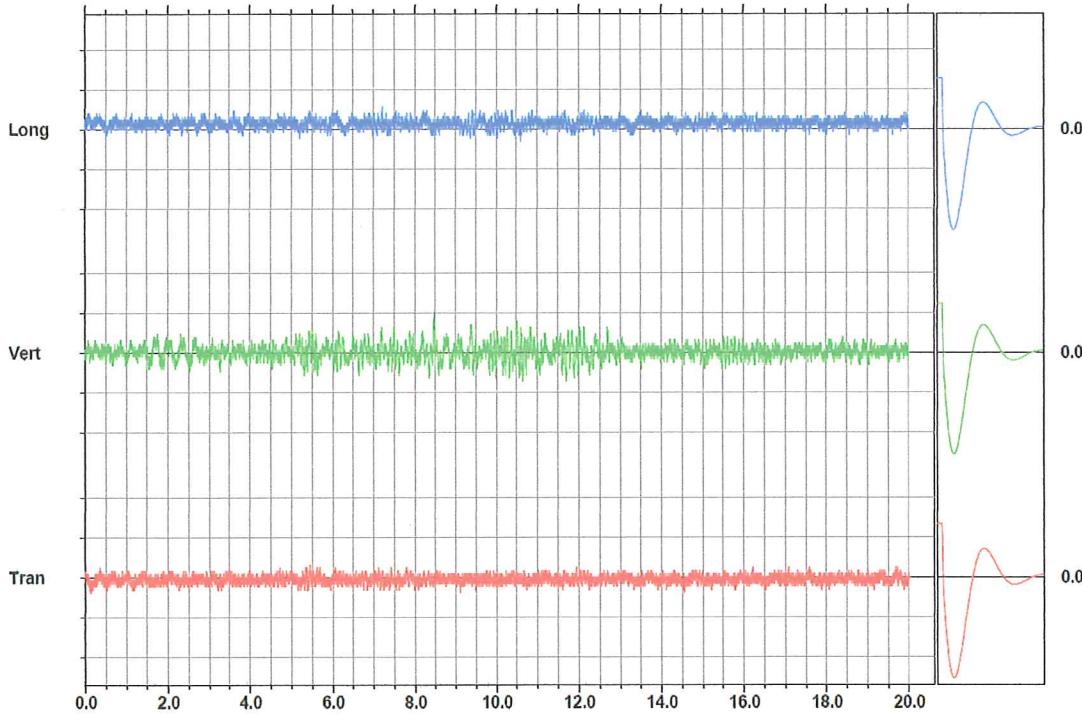
#### USBM RI8507 And OSMRE



#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.206	0.111	mm/s
PPV	29.0	37.3	31.9	dB
ZC Freq	51	9.3	18	Hz
Time (Rel. to Trig)	0.132	8.470	7.215	sec
Peak Acceleration	0.00663	0.00663	0.00994	g
Peak Displacement	0.00049	0.00312	0.00227	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.4	7.4	Hz
Overswing Ratio	3.6	3.7	3.9	
Peak Vector Sum	0.209 mm/s at 8.470 sec			

Peak Vector Sum 0.209 mm/s at 8.470 sec



Sensor Check

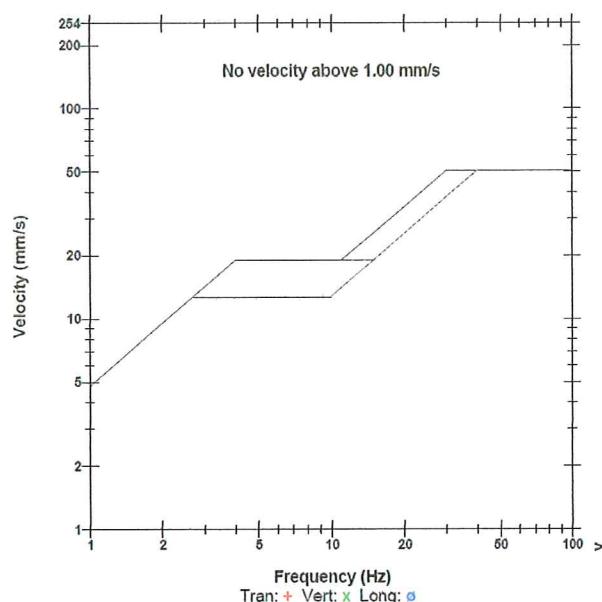


### Event Report

Date/Time Manual at 16:30:28 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1  
 Notes  
 Location: SITIO 11 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO11

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I63K.ISO

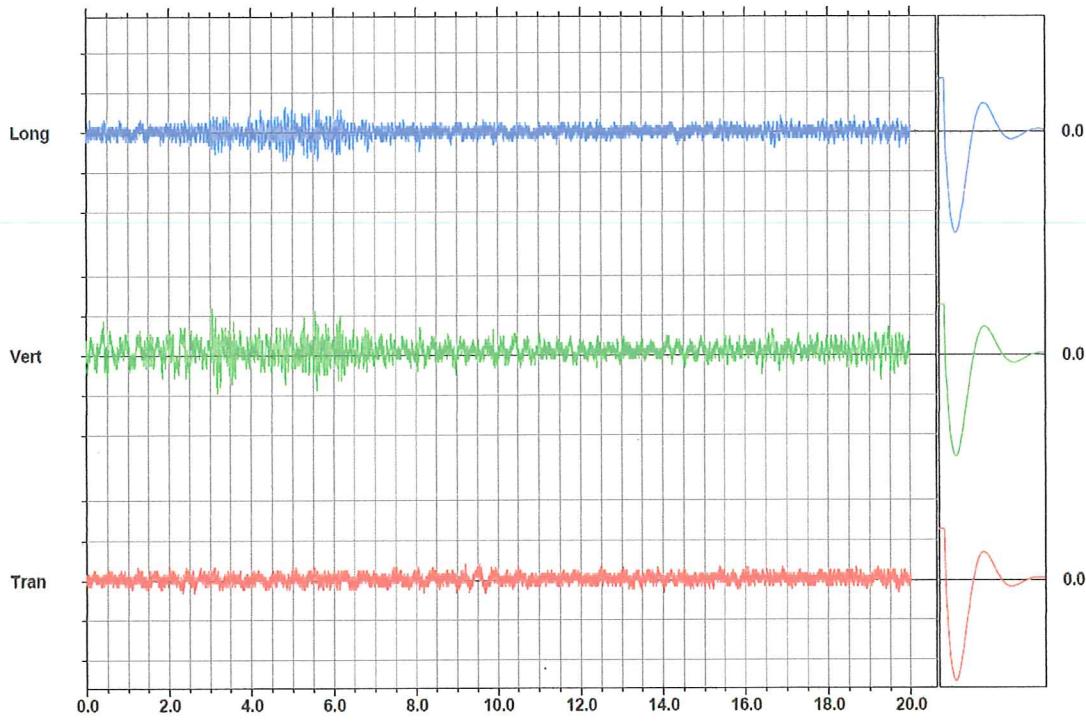
#### USBM RI8507 And OSMRE



#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.238	0.143	mm/s
PPV	29.0	38.5	34.1	dB
ZC Freq	51	11	13	Hz
Time (Rel. to Trig)	9.198	3.055	4.786	sec
Peak Acceleration	0.00829	0.00829	0.00663	g
Peak Displacement	0.00051	0.000627	0.00148	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.6	7.7	Hz
Overswing Ratio	3.7	3.6	3.6	
Peak Vector Sum	0.251 mm/s at 3.055 sec			

Peak Vector Sum 0.251 mm/s at 3.055 sec



Sensor Check

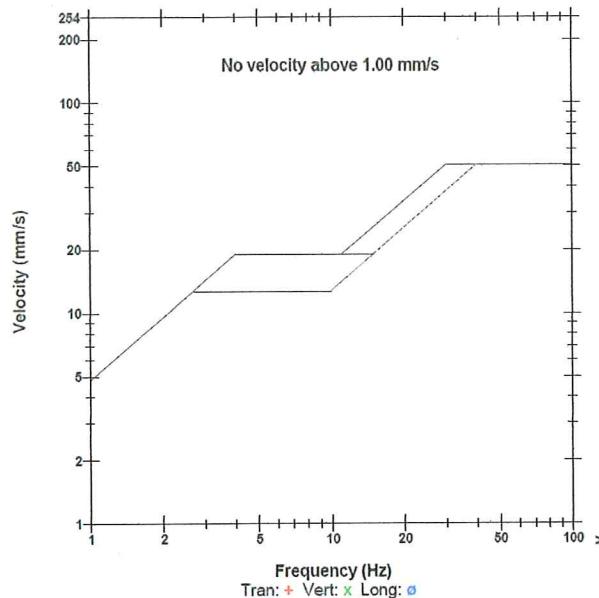


### Event Report

Date/Time Manual at 16:40:54 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1  
**Notes**  
 Location: SITIO 11 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO11

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I63L.060

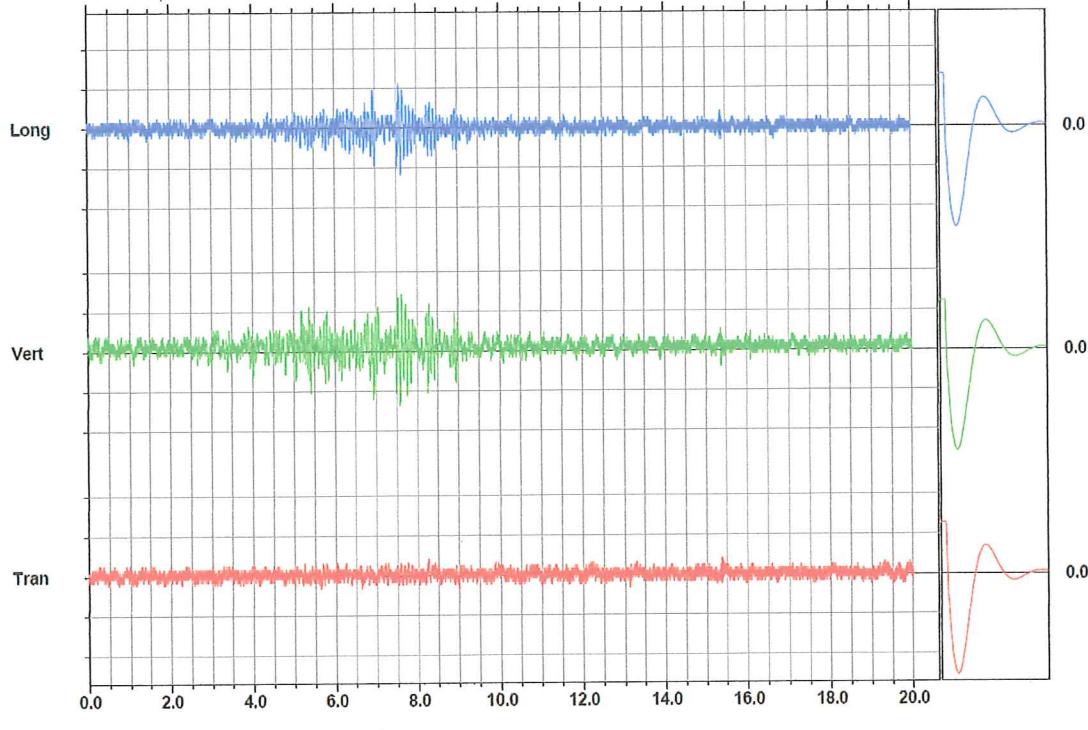
#### USBM RI8507 And OSMRE



#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.286	0.238	mm/s
PPV	29.0	40.1	38.5	dB
ZC Freq	28	10	12	Hz
Time (Rel. to Trig)	8.246	7.623	7.619	sec
Peak Acceleration	0.00829	0.0116	0.00829	g
Peak Displacement	0.00054	0.00391	0.00322	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.6	7.7	Hz
Overswing Ratio	3.7	3.6	3.6	

Peak Vector Sum 0.353 mm/s at 7.577 sec



Sensor Check



**Event Report**

Date/Time Manual at 16:31:53 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 26  
 Notes  
 Location: SITIO 11 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

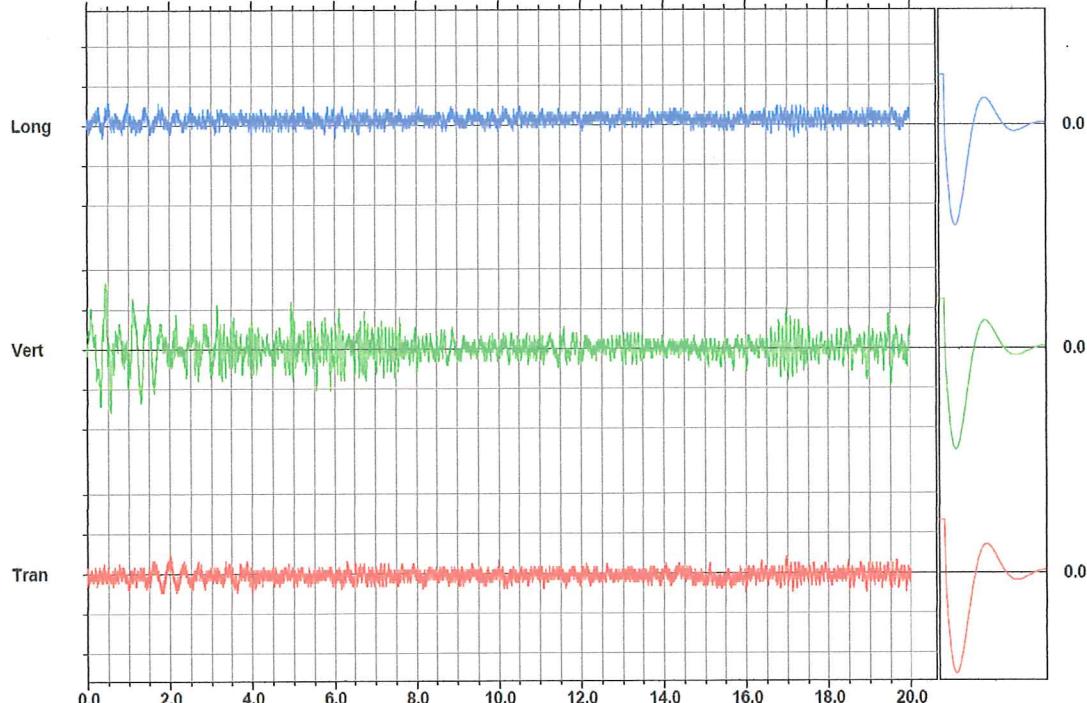
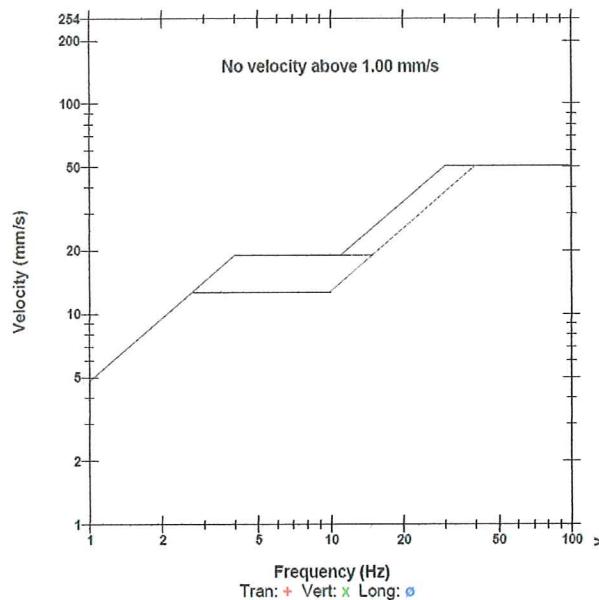
**Extended Notes**

PPV	0.0952	Tran	0.333	Vert	0.111	Long		mm/s
PPV	30.6		41.5		31.9			dB
ZC Freq	3.7		4.3		4.0			Hz
Time (Rel. to Trig)	1.785		0.441		0.501			sec
Peak Acceleration	0.00829		0.00829		0.00829			g
Peak Displacement	0.00414		0.0110		0.00423			mm
Sensor Check	Passed	Passed	Passed					Hz
Frequency	7.3		7.4		7.4			
Overswing Ratio	3.7		3.8		3.9			

Peak Vector Sum 0.348 mm/s at 0.441 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I63K.L50

**USBM RI8507 And OSMRE**



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check



### Event Report

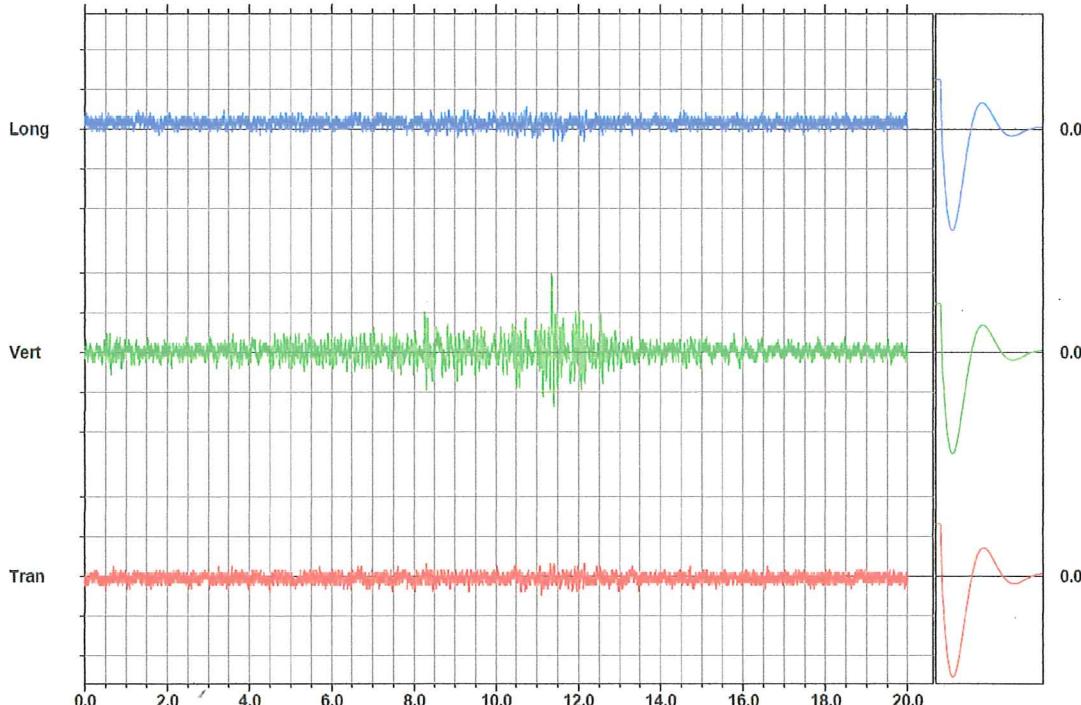
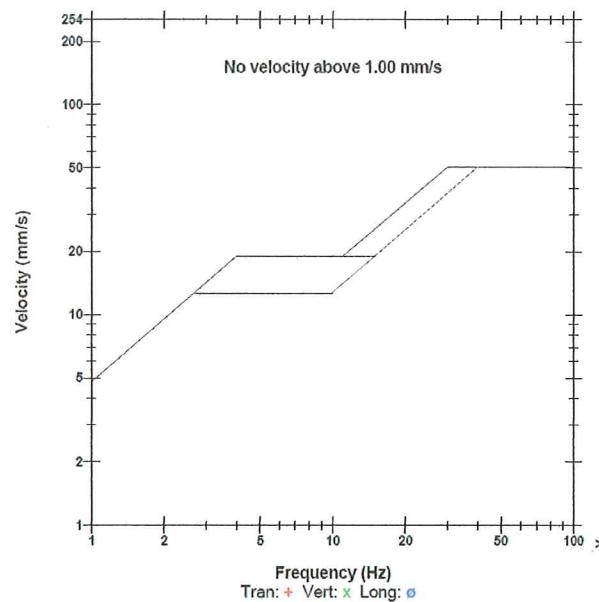
Date/Time Manual at 16:42:17 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 26  
 Notes  
 Location: SITIO 11 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

**Extended Notes**

PPV	0.0952	Tran	0.397	Vert	0.111	Long		mm/s
PPV	30.6		43.0		31.9			dB
ZC Freq	17		11		11			Hz
Time (Rel. to Trig)	11.107		11.355		10.746			sec
Peak Acceleration	0.00663		0.00829		0.00663			g
Peak Displacement	0.00095		0.00561		0.00269			mm
Sensor Check	Passed	Passed	Passed					Hz
Frequency	7.3		7.4		7.5			
Overswing Ratio	3.7		3.7		3.9			

Peak Vector Sum 0.405 mm/s at 11.355 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I63L.2H0

**USBM RI8507 And OSMRE**


Sensor Check

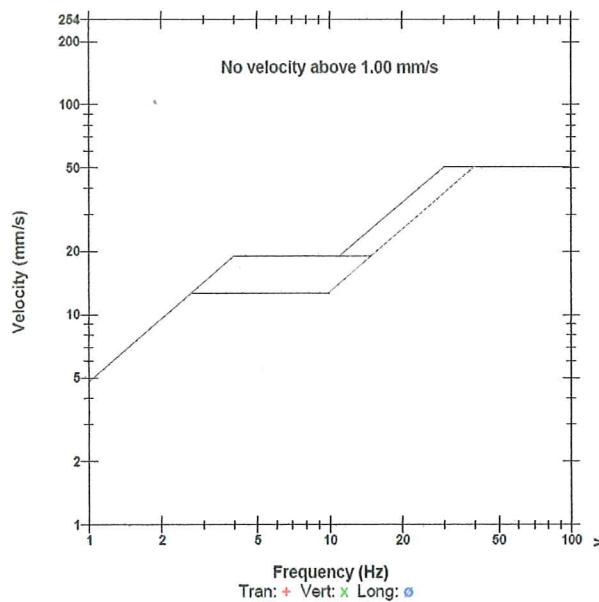


### Event Report

Date/Time Manual at 16:56:11 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1  
**Notes**  
 Location: SITIO 12 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO12

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I63L.PNO

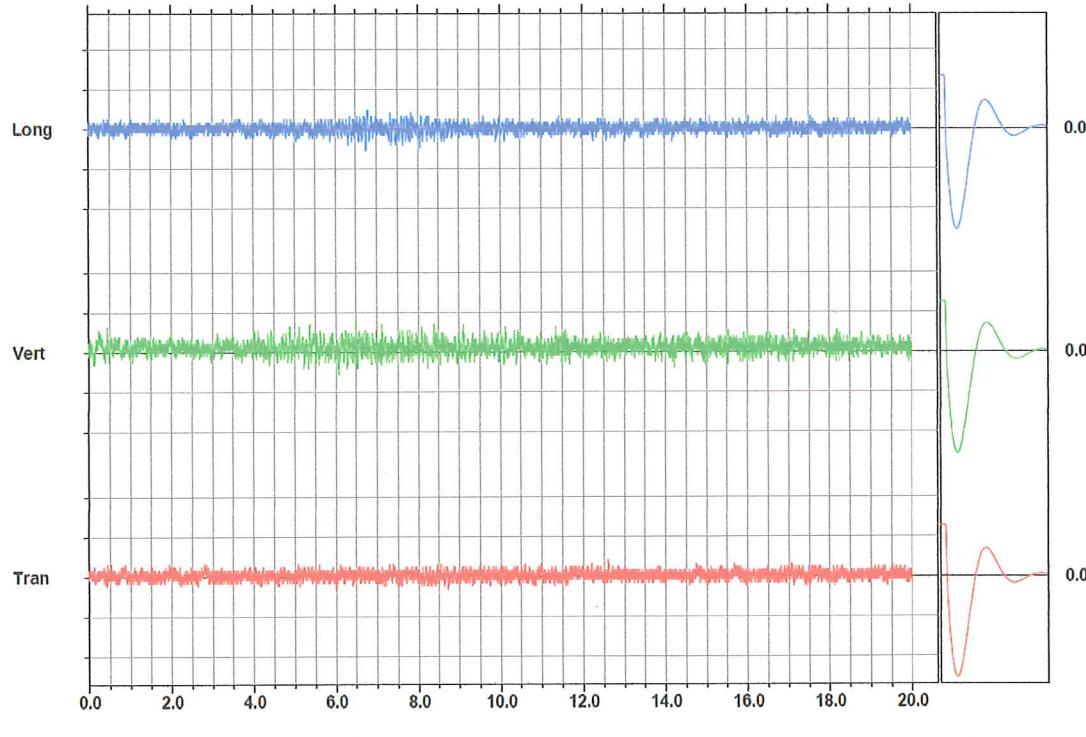
#### USBM RI8507 And OSMRE



#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.143	0.111	mm/s
PPV	29.0	34.1	31.9	dB
ZC Freq	73	13	17	Hz
Time (Rel. to Trig)	12.605	5.369	6.744	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00029	0.00309	0.00113	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.5	7.7	Hz
Overswing Ratio	3.8	3.6	3.6	
Peak Vector Sum	0.146 mm/s at 9.109 sec			

Peak Vector Sum 0.146 mm/s at 9.109 sec



Sensor Check

**Instantel**
**Event Report**

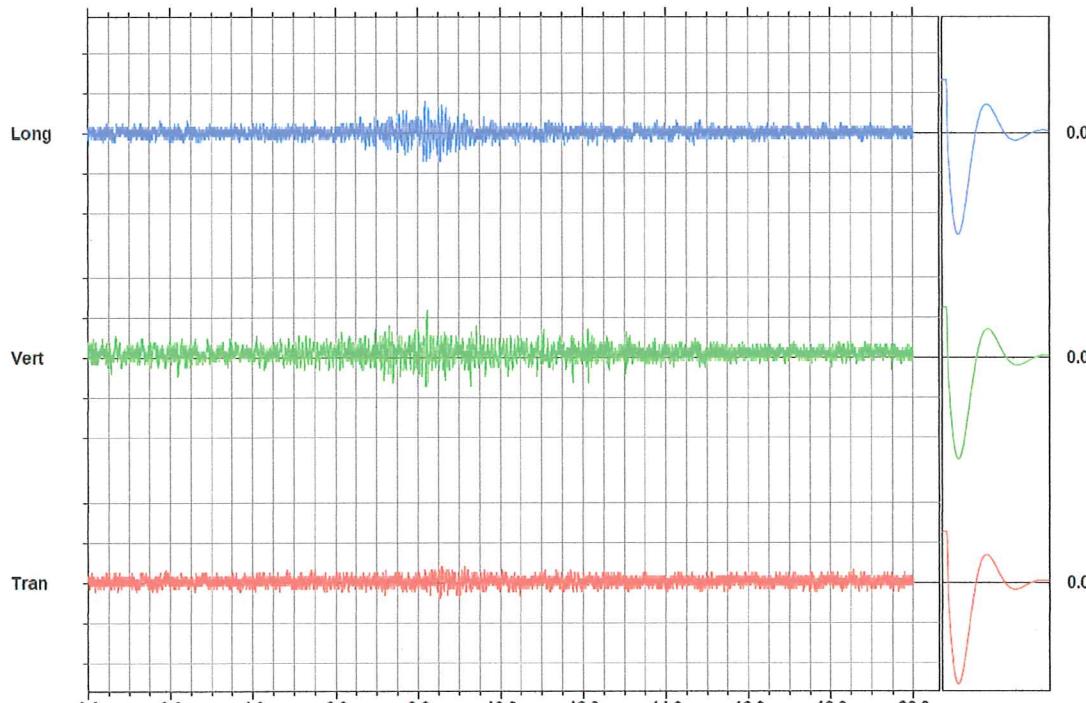
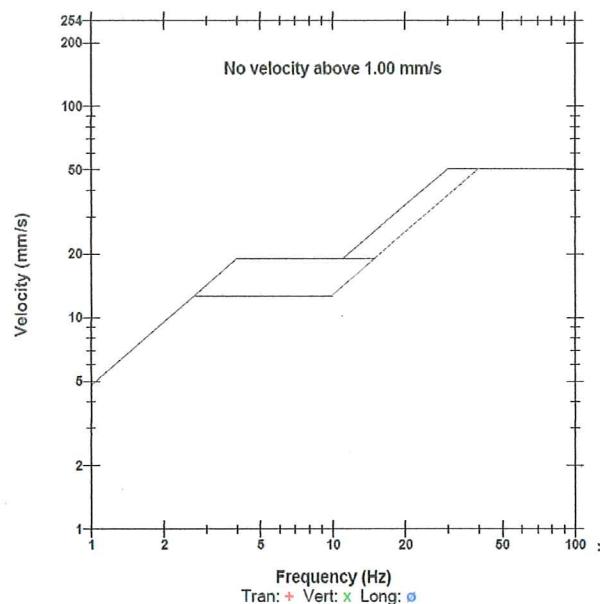
Date/Time Manual at 17:02:20 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1  
**Notes**  
 Location: SITIO 12 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO12

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I63L.ZW0

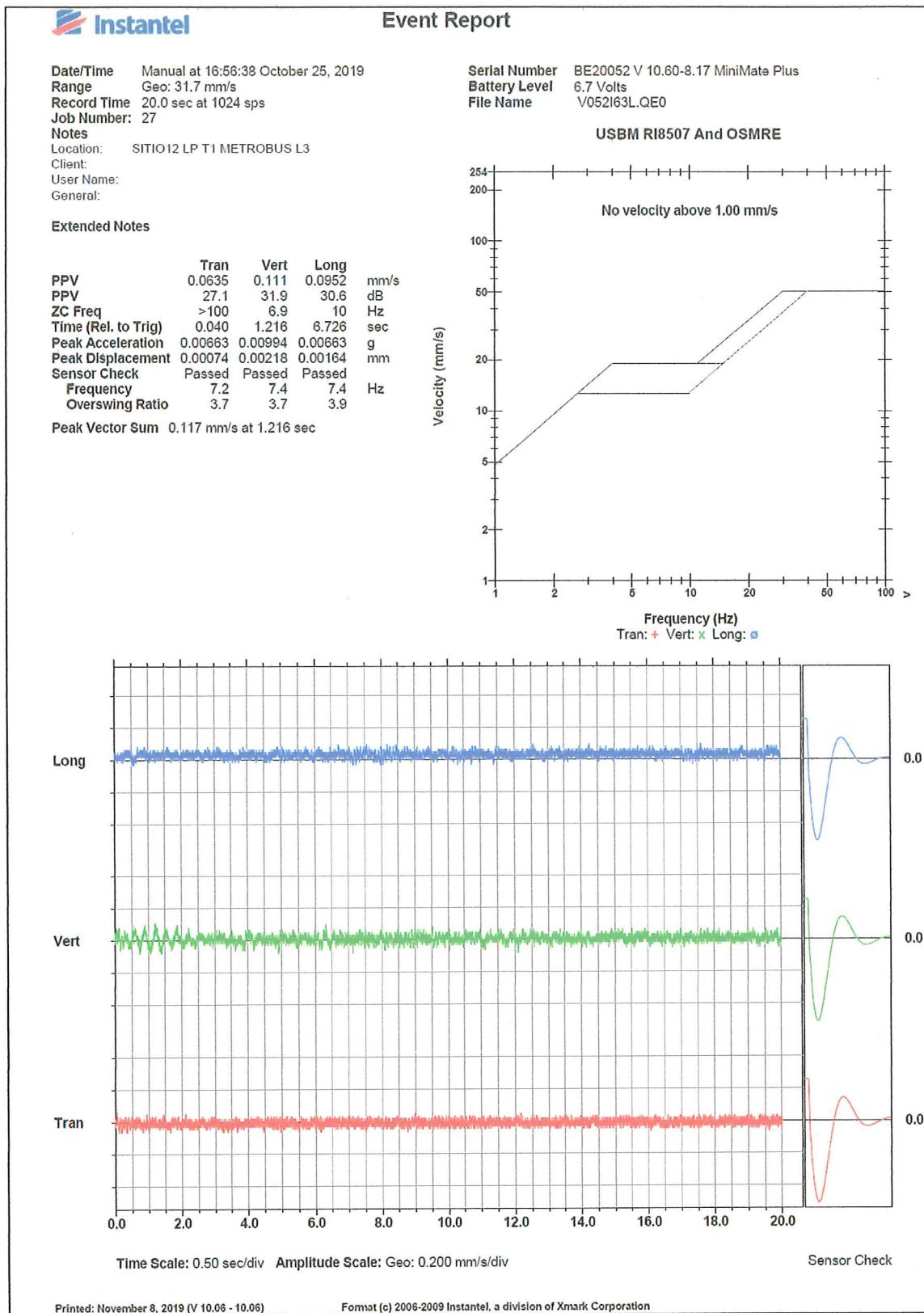
**USBM RI8507 And OSMRE**
**Extended Notes**

	Tran	Vert	Long	
PPV	0.0794	0.238	0.159	mm/s
PPV	29.0	38.5	35.0	dB
ZC Freq	23	15	17	Hz
Time (Rel. to Trig)	8.536	8.219	8.174	sec
Peak Acceleration	0.00829	0.00829	0.00663	g
Peak Displacement	0.00077	0.00248	0.00170	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.7	Hz
Overswing Ratio	3.8	3.6	3.6	

Peak Vector Sum 0.256 mm/s at 8.217 sec



Sensor Check





**Event Report**

Date/Time Manual at 17:02:48 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 27

**Notes**  
 Location: SITIO 12 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

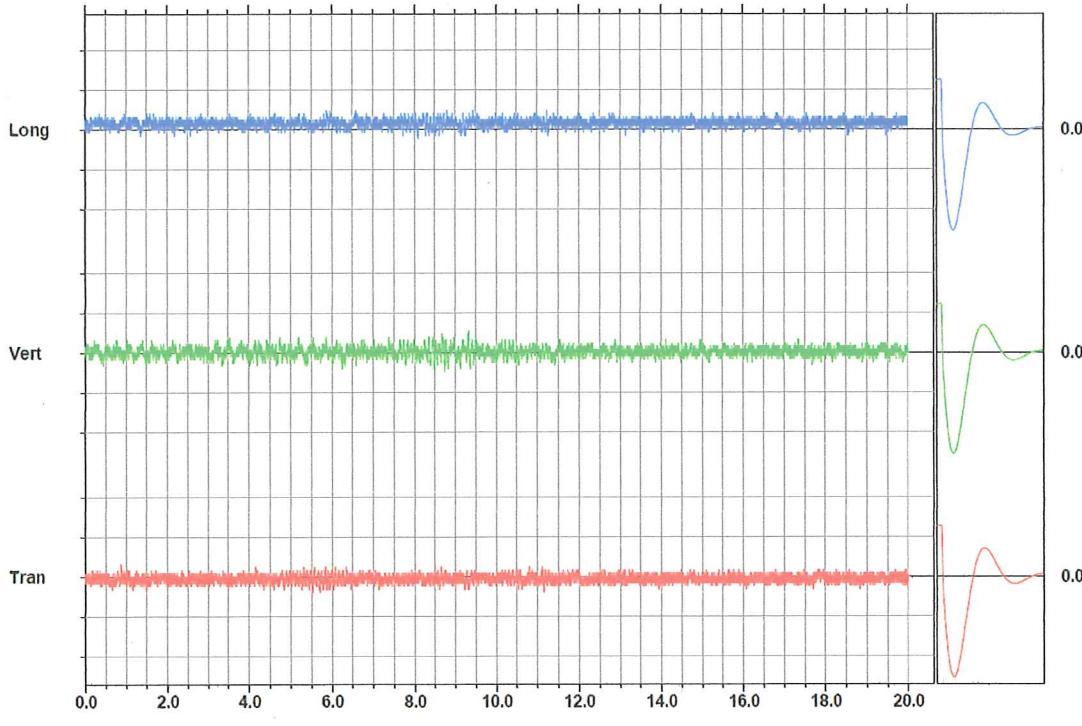
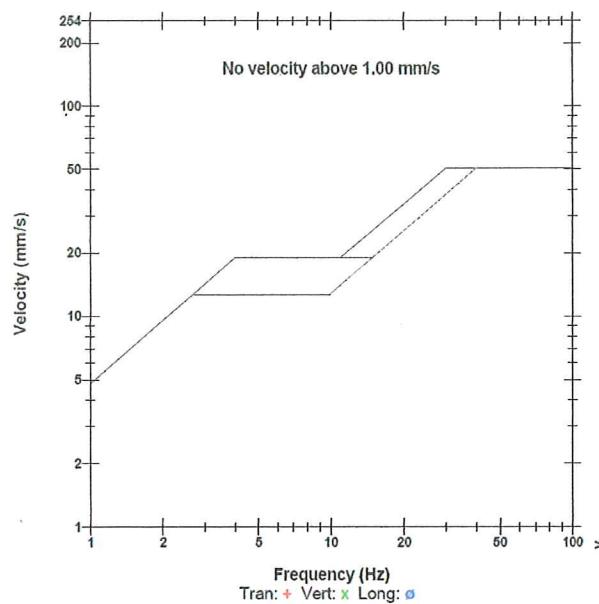
**Extended Notes**

	Tran	Vert	Long	
PPV	0.0794	0.111	0.0952	mm/s
PPV	29.0	31.9	30.6	dB
ZC Freq	22	16	10	Hz
Time (Rel. to Trig)	5.523	9.316	5.892	sec
Peak Acceleration	0.00663	0.00829	0.00829	g
Peak Displacement	0.00054	0.00101	0.00205	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.2	7.4	7.4	
Overswing Ratio	3.7	3.7	3.9	

Peak Vector Sum 0.116 mm/s at 9.316 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I63M.000

**USBM RI8507 And OSMRE**



Sensor Check



### Event Report

Date/Time Manual at 17:16:24 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 13 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO13

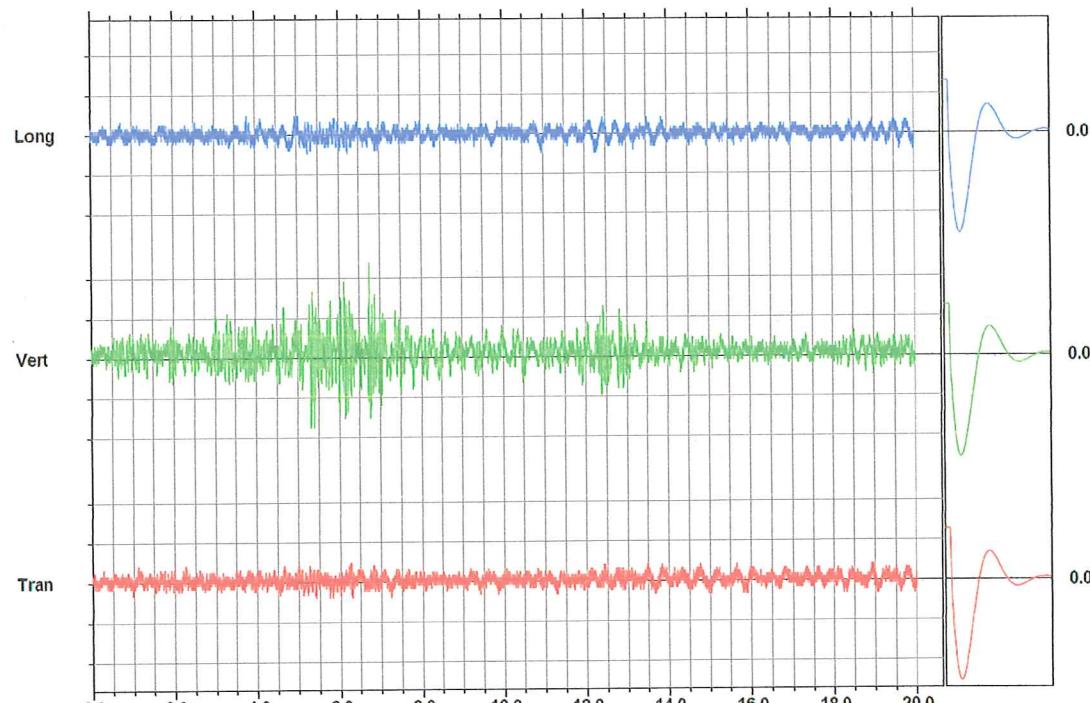
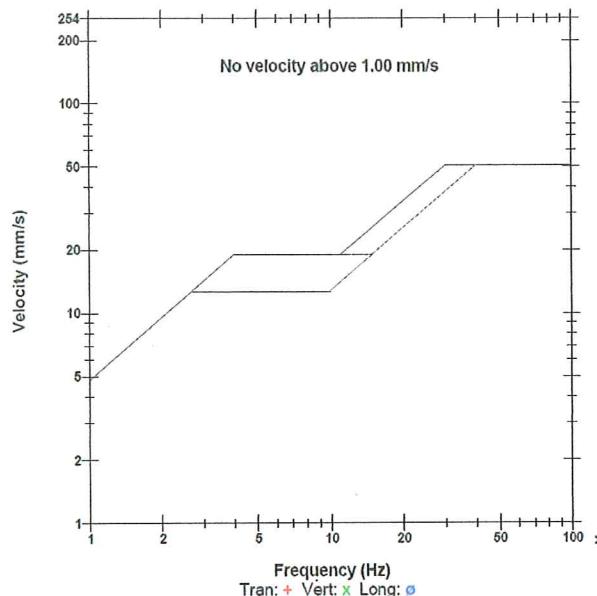
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.478	0.0952	mm/s
PPV	30.6	44.6	30.6	dB
ZC Freq	17	16	20	Hz
Time (Rel. to Trig)	6.261	6.736	3.789	sec
Peak Acceleration	0.00829	0.00829	0.00663	g
Peak Displacement	0.00114	0.00494	0.00336	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.7	7.5	7.6	
Overswing Ratio	3.7	3.6	3.6	

Peak Vector Sum 0.478 mm/s at 6.736 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I63M.NCO

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 17:24:18 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

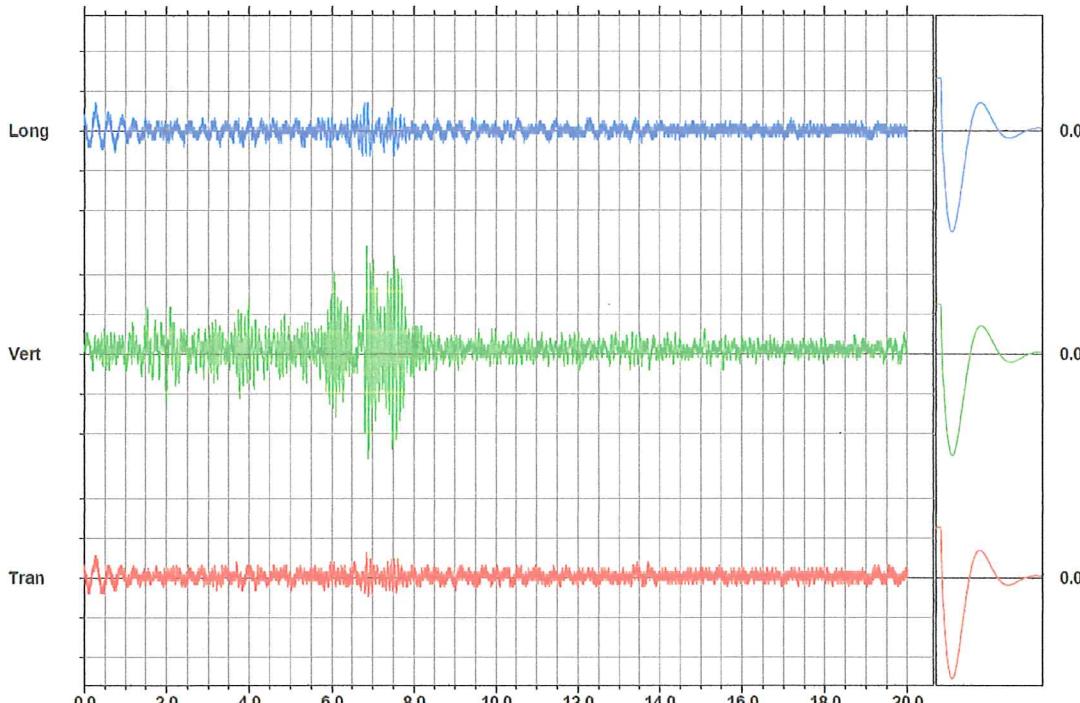
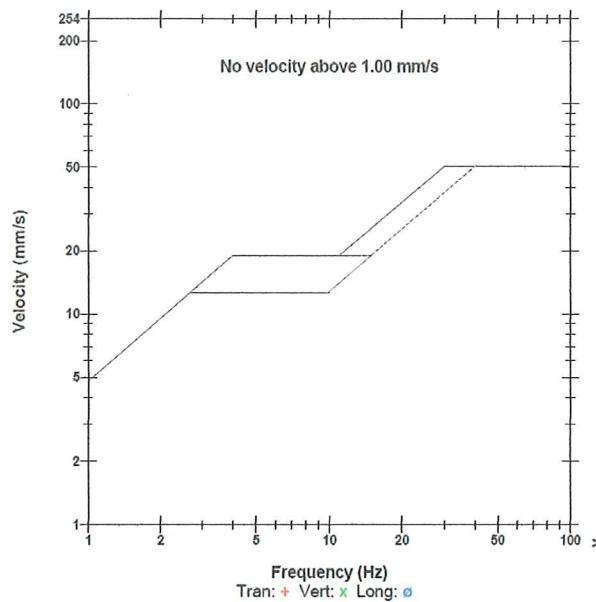
**Notes**  
 Location: SITIO 13 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO2

**Extended Notes**

	Tran	Vert	Long	
PPV	0.127	0.603	0.143	mm/s
PPV	33.1	46.6	34.1	dB
ZC Freq	14	12	4.5	Hz
Time (Rel. to Trig)	6.847	6.854	0.266	sec
Peak Acceleration	0.00663	0.00994	0.00663	g
Peak Displacement	0.00491	0.00750	0.00471	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.6	7.7	Hz
Overswing Ratio	3.7	3.6	3.6	
Peak Vector Sum	0.613 mm/s at 6.854 sec			

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I63N.010

**USBM RI8507 And OSMRE**



Sensor Check



### Event Report

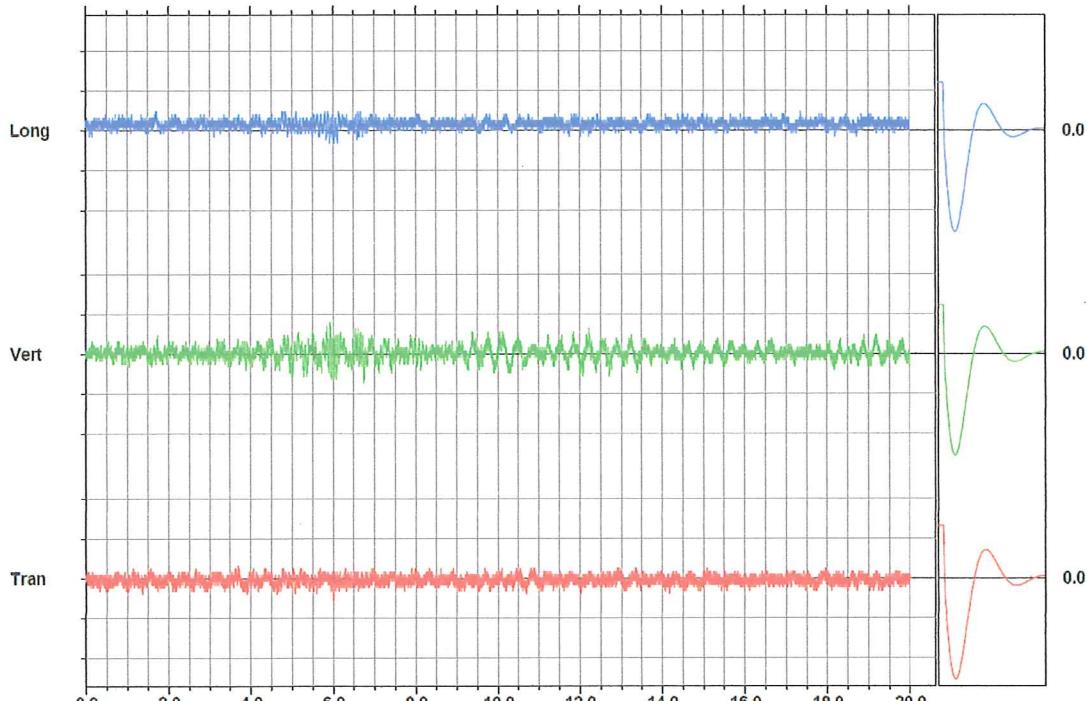
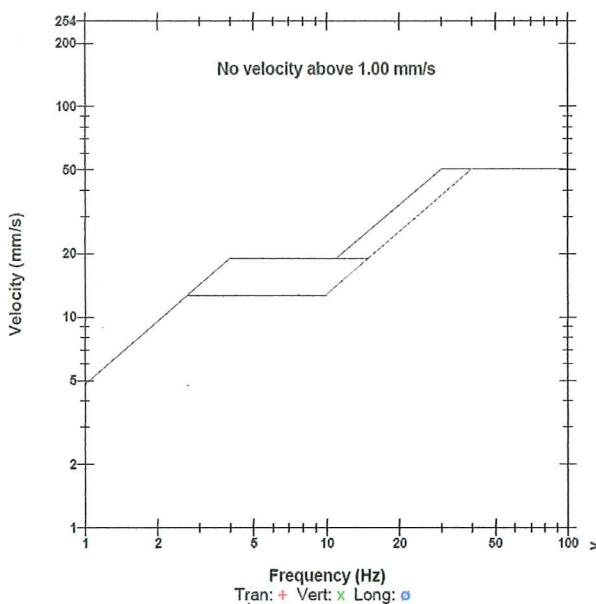
Date/Time Manual at 17:15:27 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 28  
**Notes**  
 Location: SITIO I3 LP T1 METROBES L3  
 Client:  
 User Name:  
 General:

#### Extended Notes

	Tran	Vert	Long	
PPV	0.111	0.159	0.0952	mm/s
PPV	31.9	35.0	30.6	dB
ZC Freq	19	16	6.7	Hz
Time (Rel. to Trig)	6.014	5.930	1.690	sec
Peak Acceleration	0.00663	0.00829	0.00829	g
Peak Displacement	0.00084	0.00334	0.00236	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.3	7.4	7.5	
Overswing Ratio	3.6	3.7	3.9	
Peak Vector Sum	0.160 mm/s at 5.930 sec			

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052163M.LR0

#### USBM RI8507 And OSMRE



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check



### Event Report

Date/Time Manual at 17:23:18 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 28

**Notes**  
 Location: SITIO I3 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

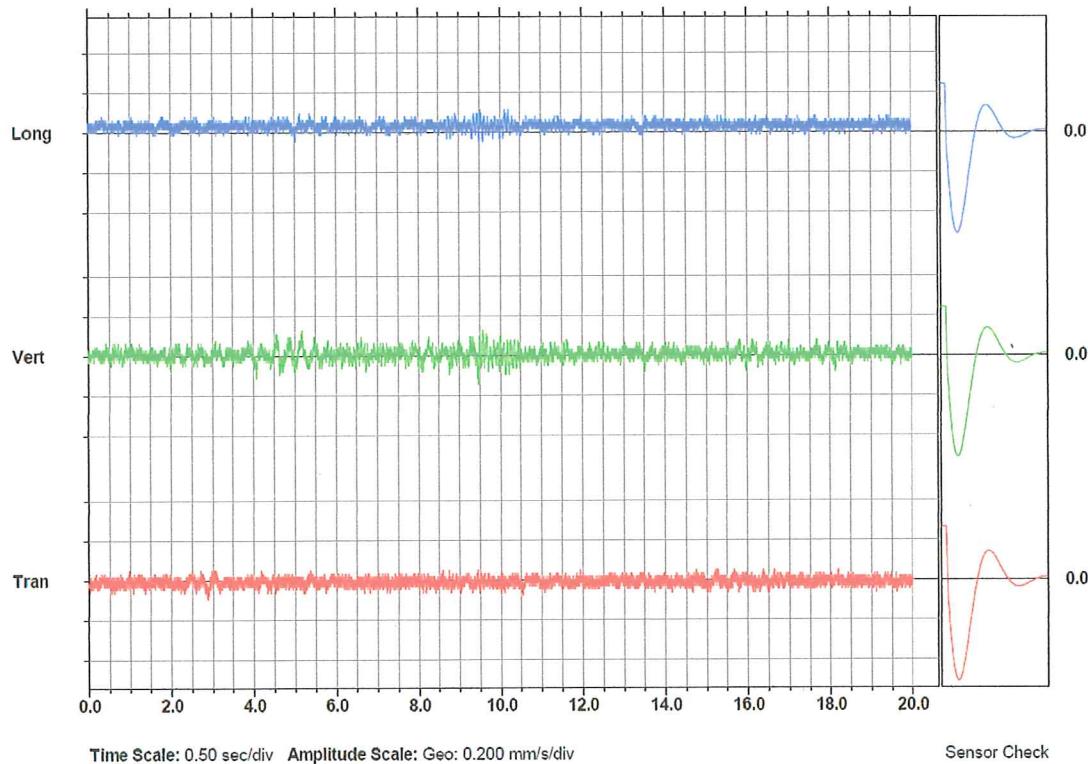
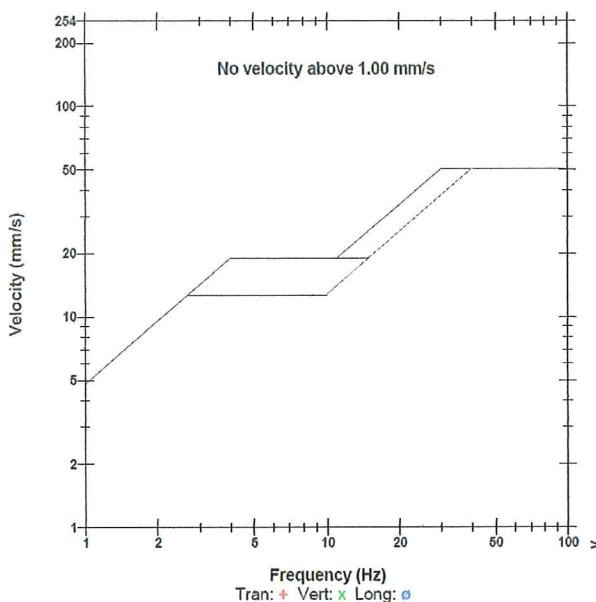
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.143	0.111	mm/s
PPV	30.6	34.1	31.9	dB
ZC Freq	8.4	13	11	Hz
Time (Rel. to Trig)	2.864	9.454	9.529	sec
Peak Acceleration	0.00663	0.00663	0.00663	g
Peak Displacement	0.00152	0.00330	0.00182	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.3	7.4	7.5	
Overswing Ratio	3.7	3.7	3.9	

Peak Vector Sum 0.163 mm/s at 9.454 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I63.M.YU0

#### USBM RI8507 And OSMRE



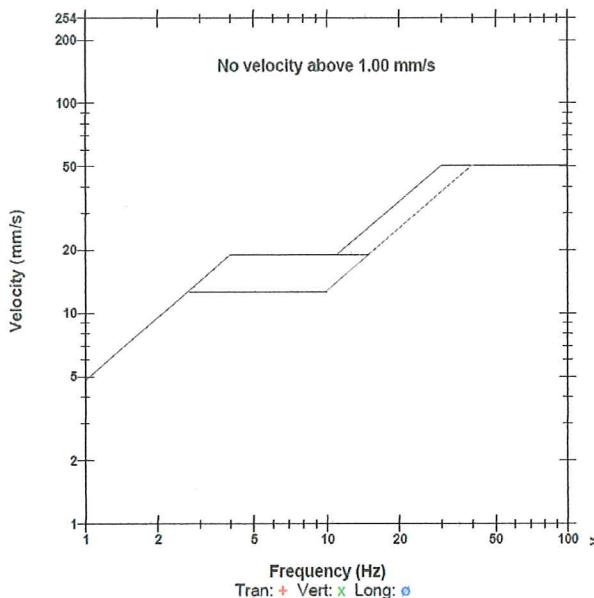


### Event Report

Date/Time Manual at 17:39:42 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1  
**Notes**  
 Location: SITIO 14 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO14

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I63N.Q60

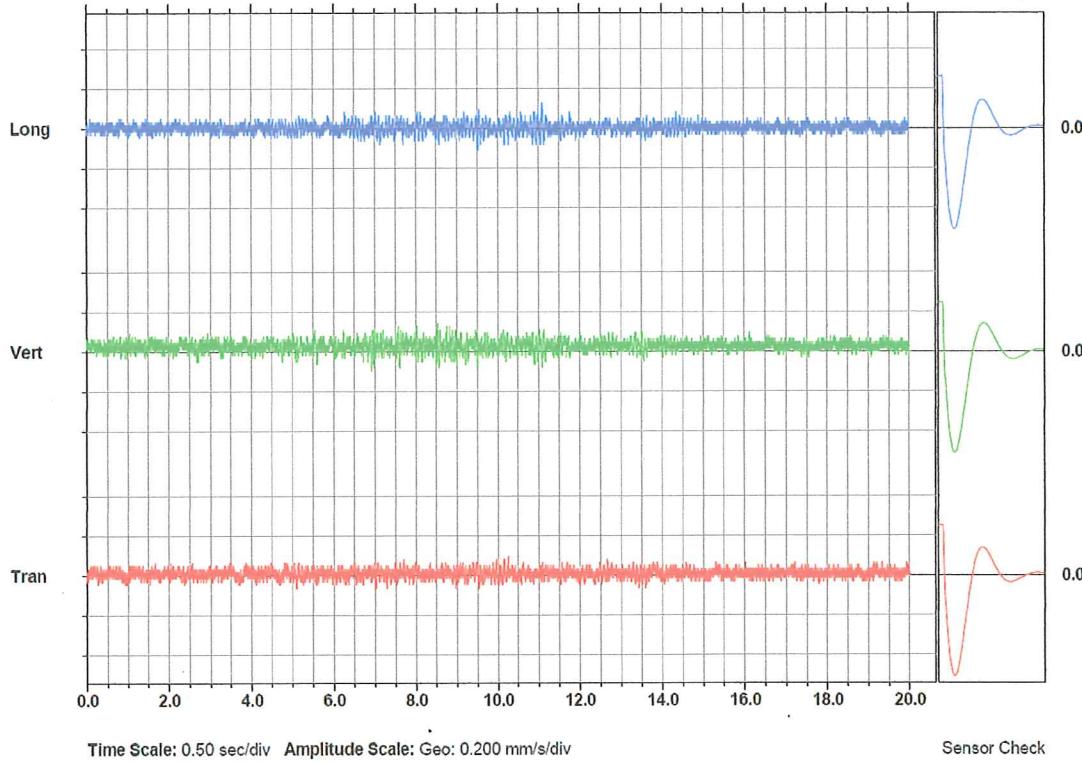
#### USBM RI8507 And OSMRE



#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.143	0.127	mm/s
PPV	30.6	34.1	33.1	dB
ZC Freq	30	20	13	Hz
Time (Rel. to Trig)	10.241	8.529	11.094	sec
Peak Acceleration	0.00663	0.00863	0.00829	g
Peak Displacement	0.00057	0.00197	0.00124	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.7	Hz
Overswing Ratio	3.7	3.6	3.6	

Peak Vector Sum 0.145 mm/s at 8.529 sec



Sensor Check



### Event Report

Date/Time Manual at 17:45:49 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

**Notes**  
 Location: SITIO 14 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO14

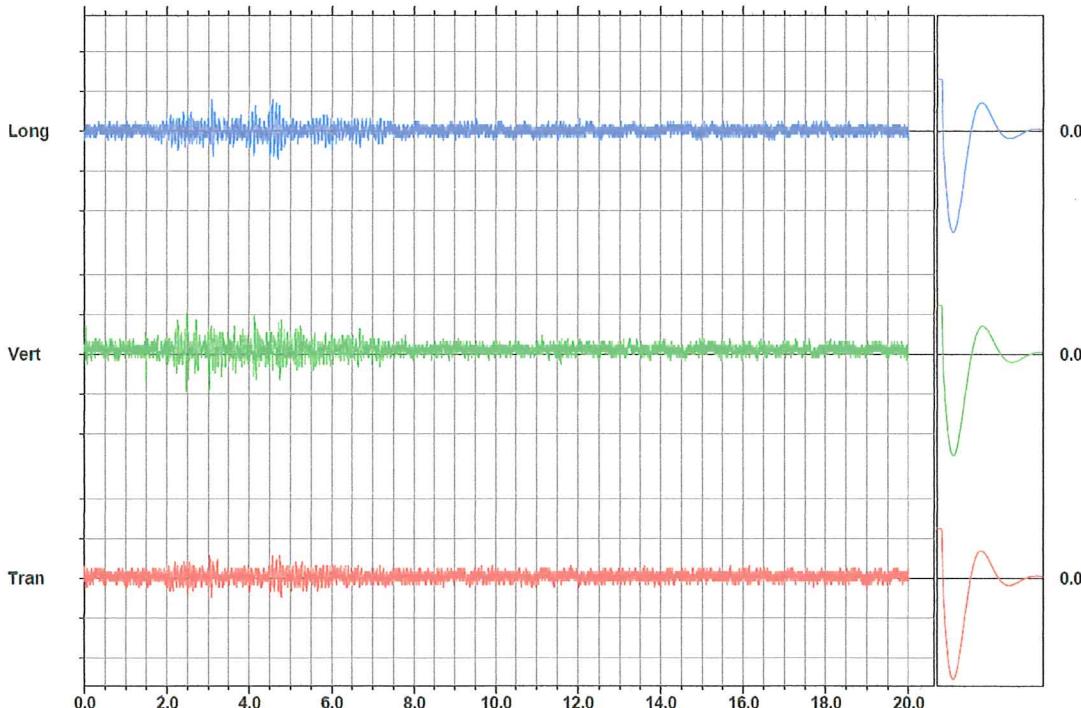
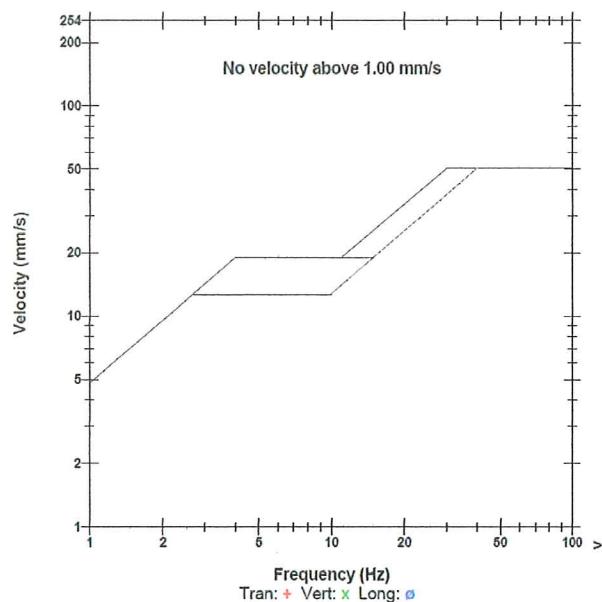
#### Extended Notes

	Tran	Vert	Long	
PPV	0.111	0.206	0.159	mm/s
PPV	31.9	37.3	35.0	dB
ZC Freq	16	12	16	Hz
Time (Rel. to Trig)	3.034	2.488	3.080	sec
Peak Acceleration	0.00829	0.00663	0.00663	g
Peak Displacement	0.00122	0.00246	0.00178	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.5	7.7	Hz
Overswing Ratio	3.8	3.6	3.6	

Peak Vector Sum 0.214 mm/s at 4.780 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I63O.0D0

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 17:40:32 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 29

Notes  
 Location: SITIO 14 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

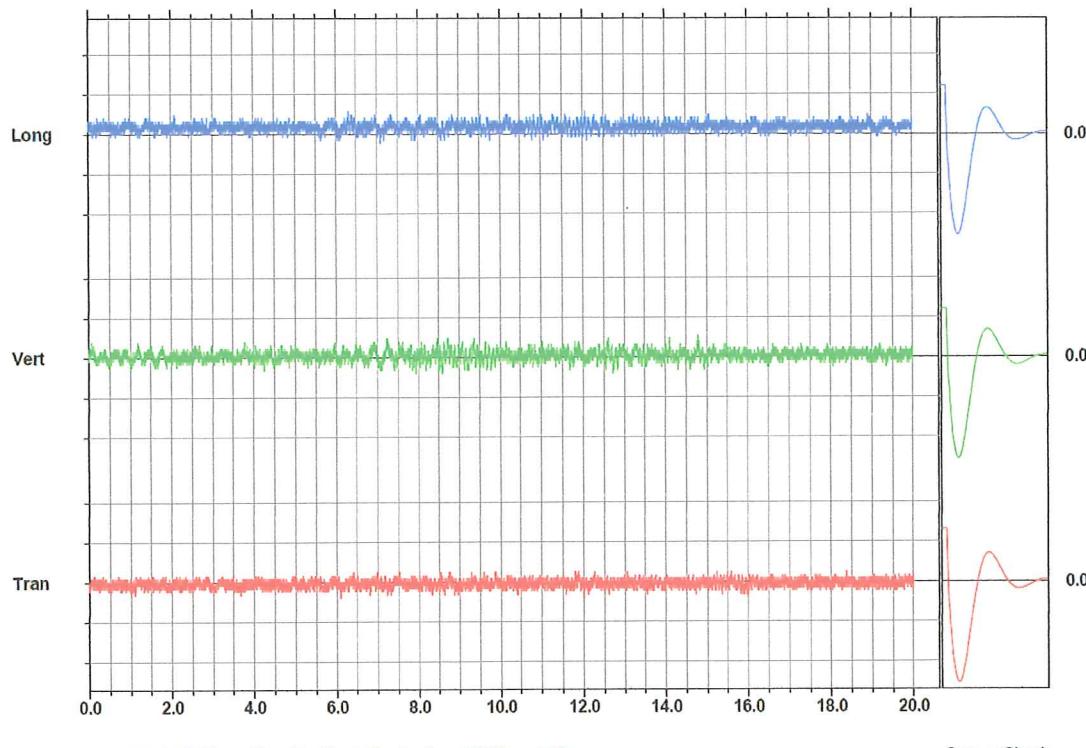
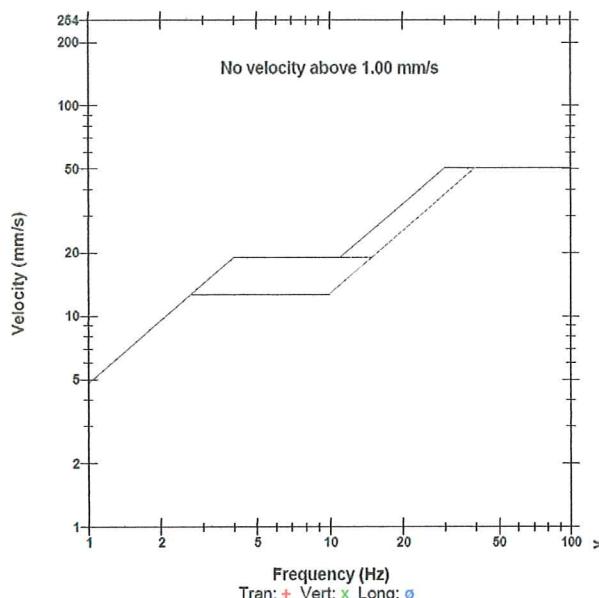
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.111	0.111	mm/s
PPV	29.0	31.9	31.9	dB
ZC Freq	43	8.7	8.7	Hz
Time (Rel. to Trig)	6.094	14.798	6.319	sec
Peak Acceleration	0.00829	0.00829	0.00829	g
Peak Displacement	0.00063	0.00179	0.00387	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.7	3.7	4.0	

Peak Vector Sum 0.121 mm/s at 14.798 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I63N.RK0

#### USBM R18507 And OSMRE





### Event Report

Date/Time Manual at 17:46:37 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 29

**Notes**  
 Location: SITIO 14 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

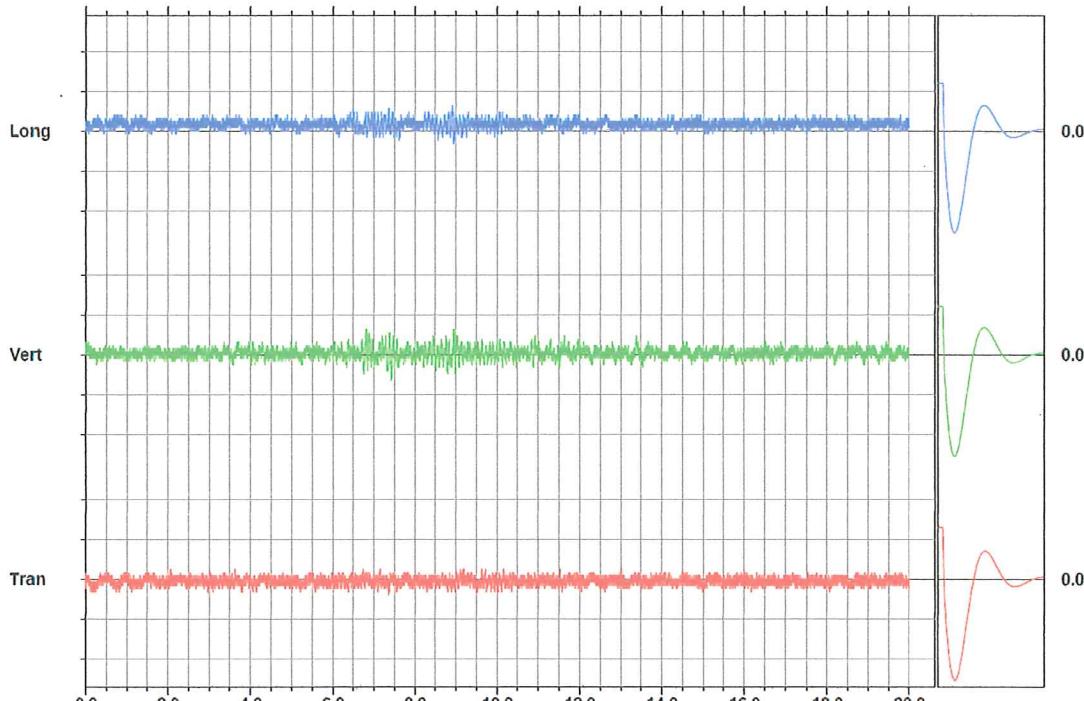
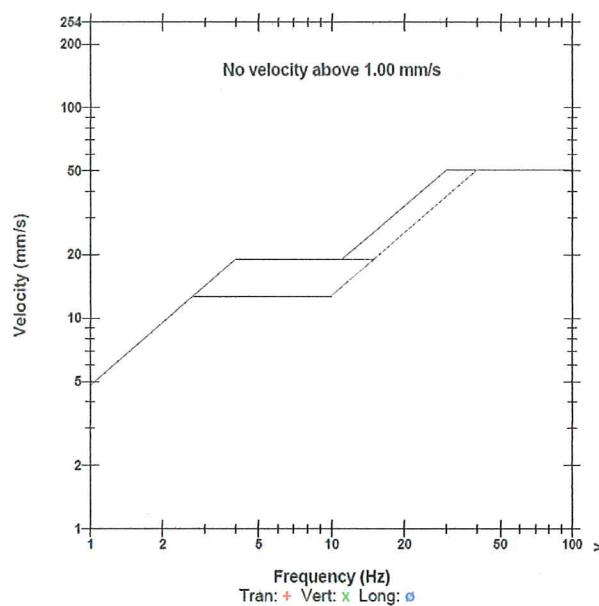
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.127	0.127	mm/s
PPV	29.0	33.1	33.1	dB
ZC Freq	22	12	9.8	Hz
Time (Rel. to Trig)	7.357	6.800	8.913	sec
Peak Acceleration	0.00829	0.00829	0.00663	g
Peak Displacement	0.00058	0.00173	0.00381	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.142 mm/s at 7.423 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I630.1P0

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 18:37:56 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 15 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO15

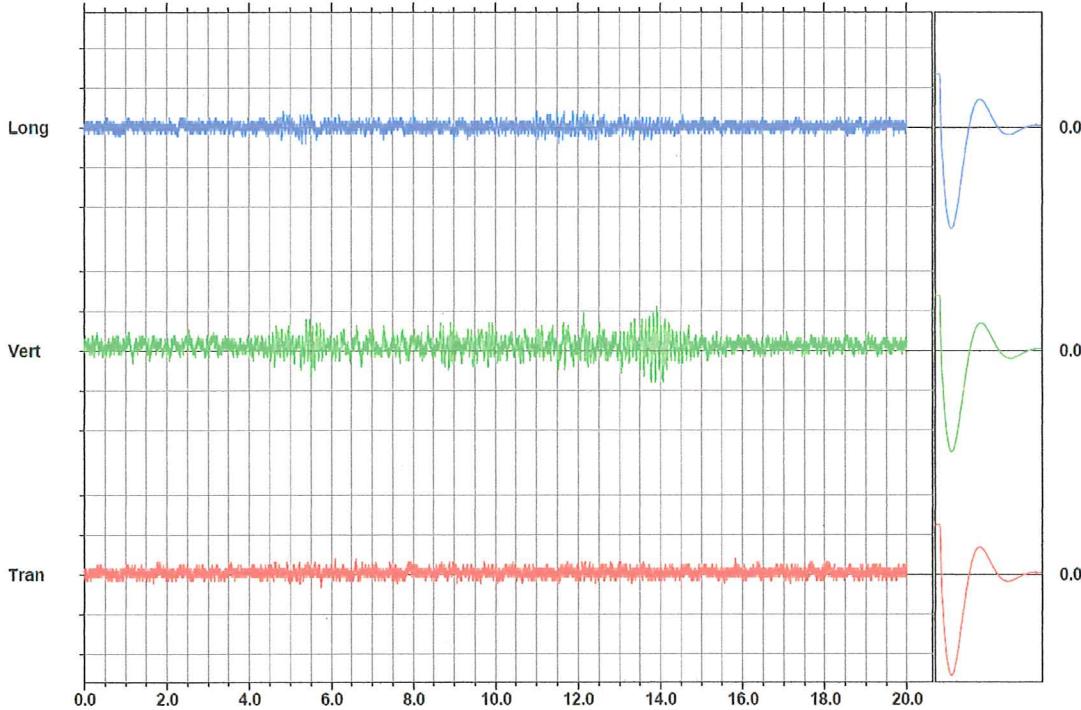
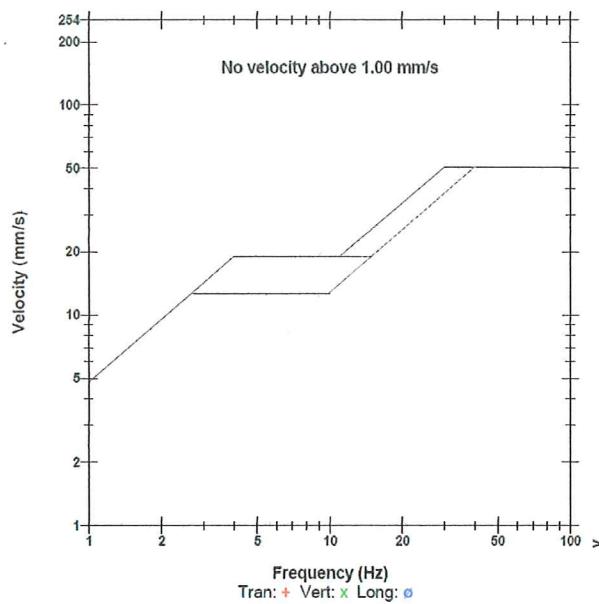
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.222	0.0794	mm/s
PPV	29.0	37.9	29.0	dB
ZC Freq	73	9.5	15	Hz
Time (Rel. to Trig)	6.090	13.915	4.837	sec
Peak Acceleration	0.00663	0.00663	0.00829	g
Peak Displacement	0.00071	0.00439	0.00081	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.7	7.5	7.7	
Overswing Ratio	3.8	3.7	3.7	

Peak Vector Sum 0.225 mm/s at 13.915 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I61V.R80

#### USBM R18507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 18:57:53 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

**Notes**  
 Location: SITIO 15 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO15

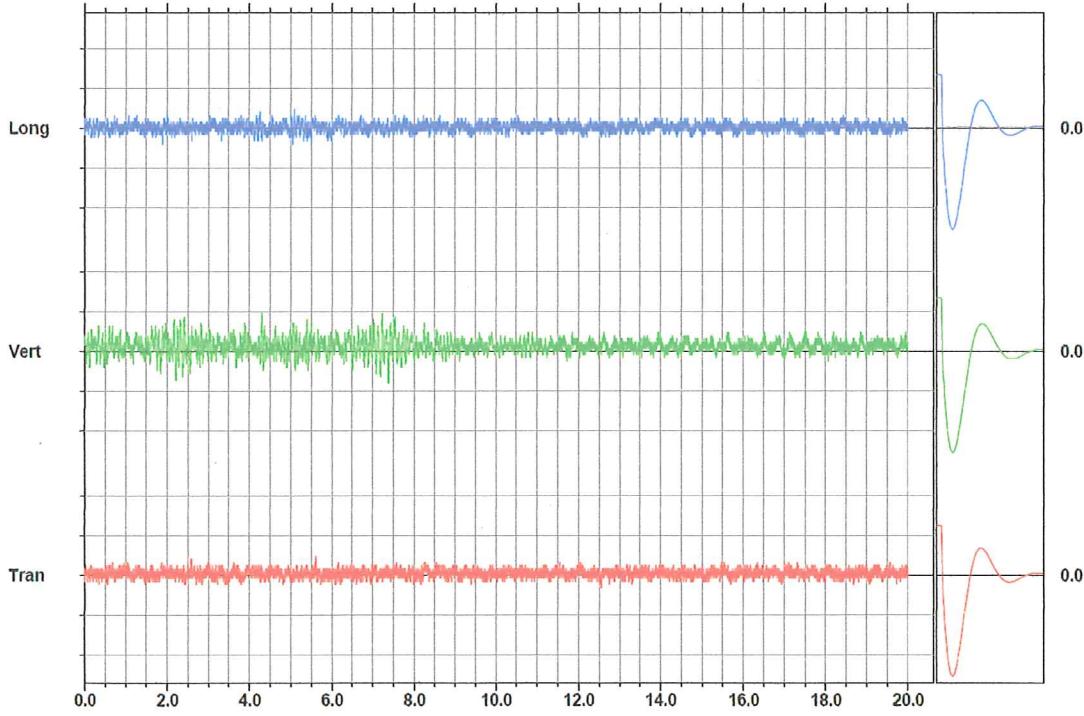
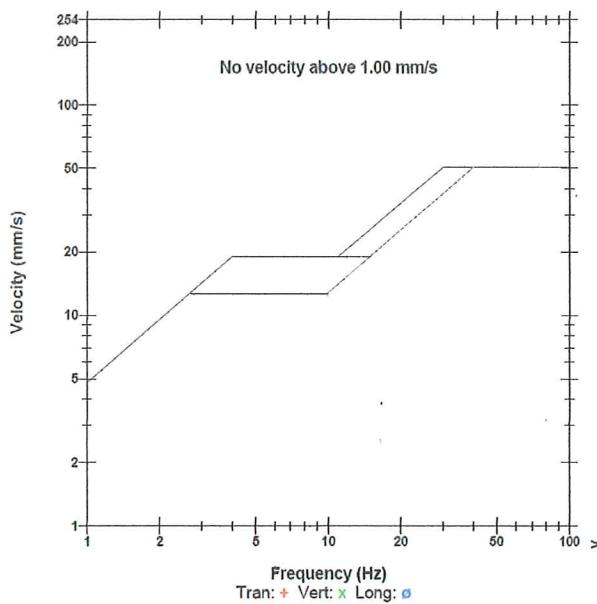
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.190	0.0952	mm/s
PPV	30.6	36.6	30.6	dB
ZC Freq	43	13	16	Hz
Time (Rel. to Trig)	5.613	4.301	5.094	sec
Peak Acceleration	0.00863	0.00863	0.00829	g
Peak Displacement	0.00029	0.00343	0.00073	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.5	7.7	Hz
Overswing Ratio	3.8	3.7	3.7	

Peak Vector Sum 0.193 mm/s at 4.303 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I61W.OH0

#### USBM RI8507 And OSMRE



Sensor Check



## Event Report

Date/Time Manual at 18:37:09 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 15

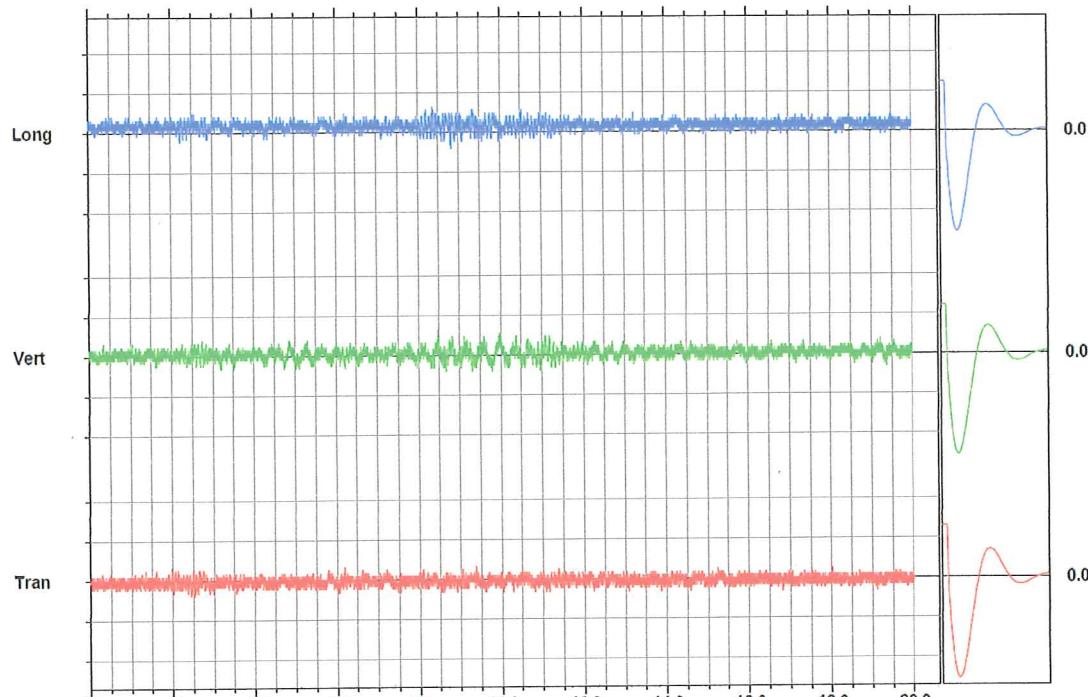
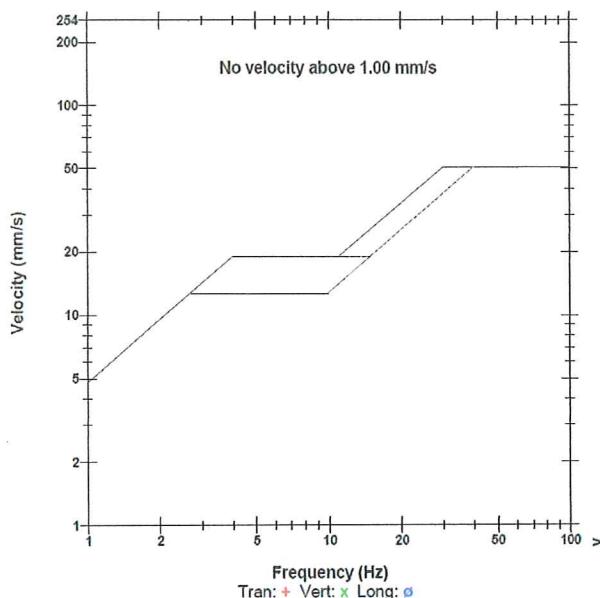
**Notes**  
 Location: SITIO 15 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

**Extended Notes**

	Tran	Vert	Long	
PPV	0.0794	0.127	0.127	mm/s
PPV	29.0	33.1	33.1	dB
ZC Freq	14	10	10	Hz
Time (Rel. to Trig)	2.448	8.473	8.361	sec
Peak Acceleration	0.00663	0.00663	0.00663	g
Peak Displacement	0.00076	0.00309	0.00361	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.7	3.8	3.9	
Peak Vector Sum	0.143 mm/s at 8.368 sec			

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I61V.PX0

**USBM RI8507 And OSMRE**



Sensor Check



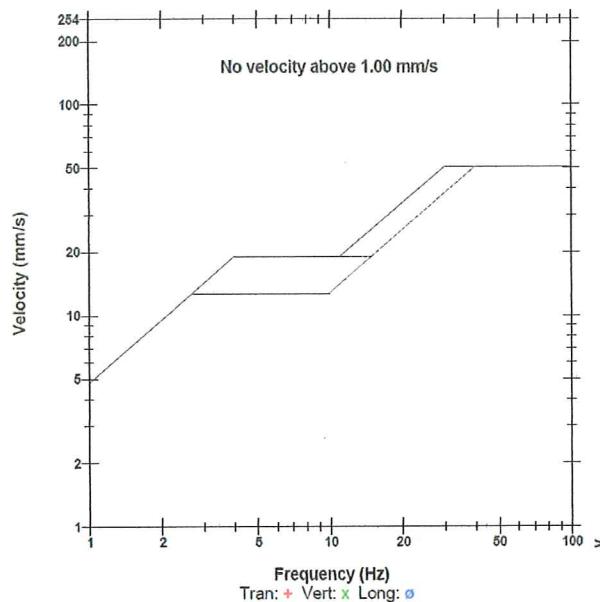
**Instintel**

**Event Report**

Date/Time Manual at 18:57:00 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 15  
 Notes  
 Location: SITIO 15 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I61W.N00

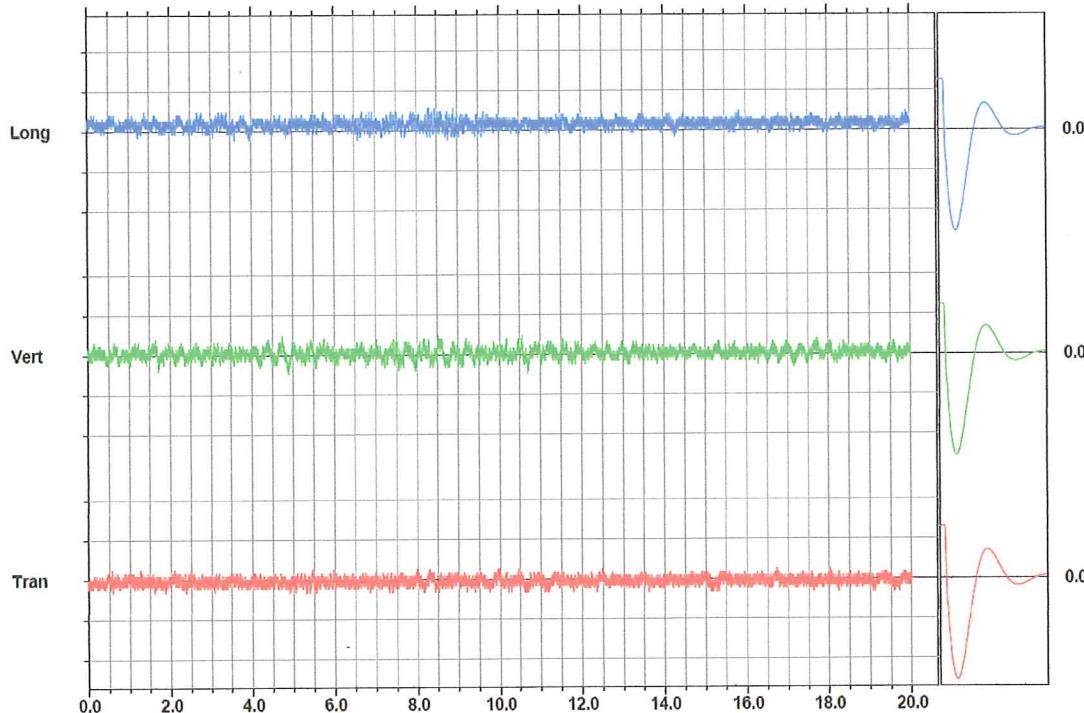
**USBM RI8507 And OSMRE**



Extended Notes

	Tran	Vert	Long	
PPV	0.0635	0.0952	0.111	mm/s
PPV	27.1	30.6	31.9	dB
ZC Freq	73	9.7	12	Hz
Time (Rel. to Trig)	0.599	4.742	8.303	sec
Peak Acceleration	0.00829	0.00863	0.00663	g
Peak Displacement	0.00064	0.00163	0.00284	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.3	7.4	7.4	
Overswing Ratio	3.7	3.8	3.9	
Peak Vector Sum	0.125 mm/s at 8.455 sec			

Peak Vector Sum 0.125 mm/s at 8.455 sec



Sensor Check

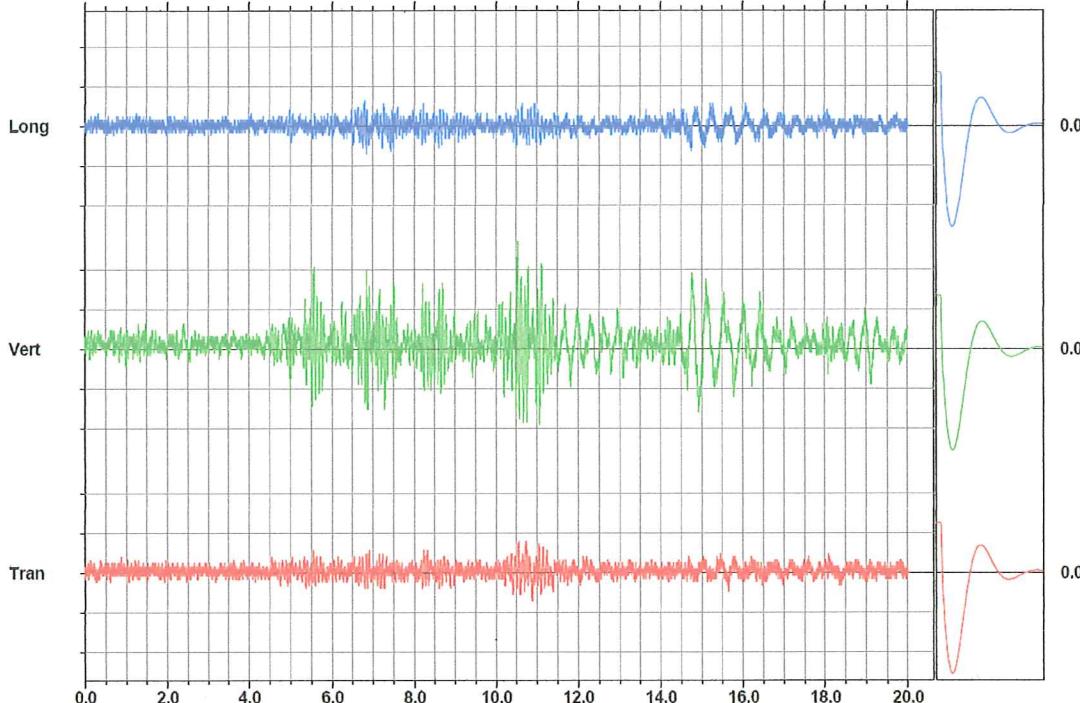
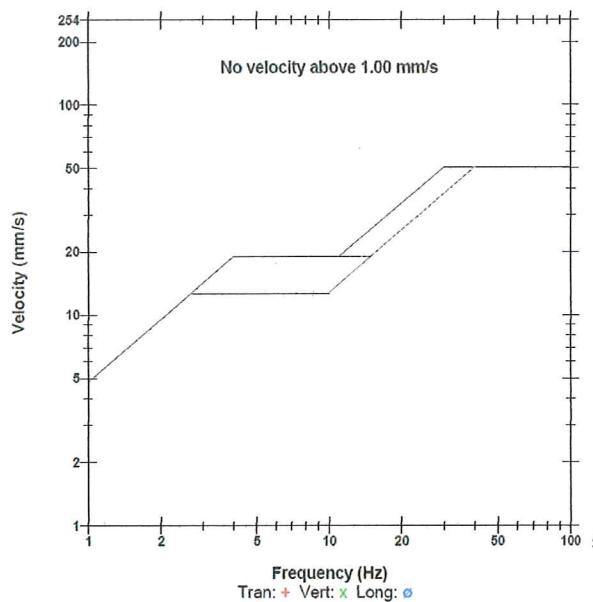


### Event Report

Date/Time Manual at 17:57:04 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1  
**Notes**  
 Location: SITIO 16 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO16

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I61T.V40

#### USBM RI8507 And OSMRE



Sensor Check



**Event Report**

Date/Time Manual at 18:19:35 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

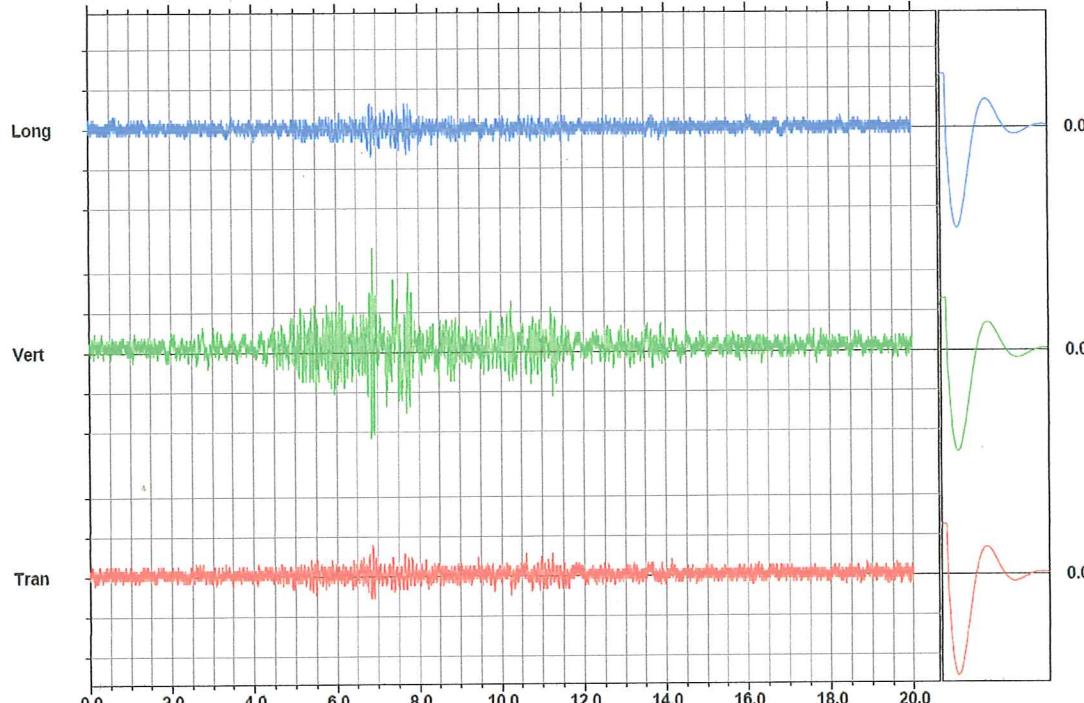
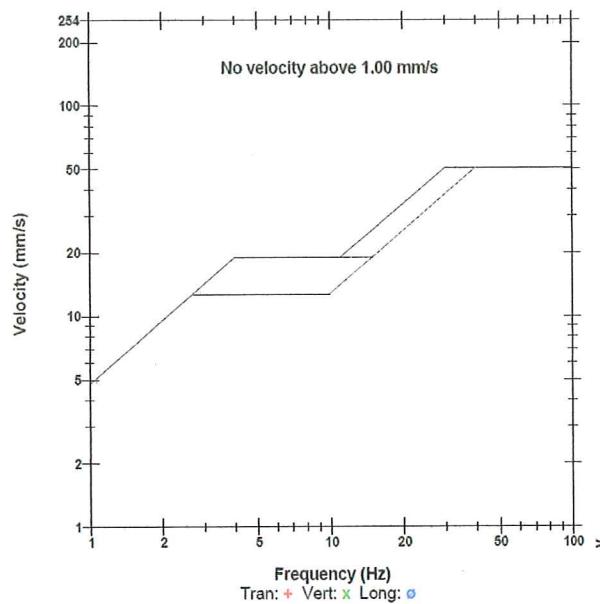
Notes  
 Location: SITIO 16 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO16

**Extended Notes**

	Tran	Vert	Long	
PPV	0.159	0.524	0.143	mm/s
PPV	35.0	45.4	34.1	dB
ZC Freq	13	13	14	Hz
Time (Rel. to Trig)	6.874	6.887	6.872	sec
Peak Acceleration	0.00663	0.00994	0.00663	g
Peak Displacement	0.00181	0.00626	0.00154	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.5	7.7	Hz
Overswing Ratio	3.8	3.7	3.7	
Peak Vector Sum	0.534 mm/s at 6.887 sec			

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I61U.WNO

**USBM RI8507 And OSMRE**



Sensor Check



### Event Report

Date/Time Manual at 17:57:58 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 14

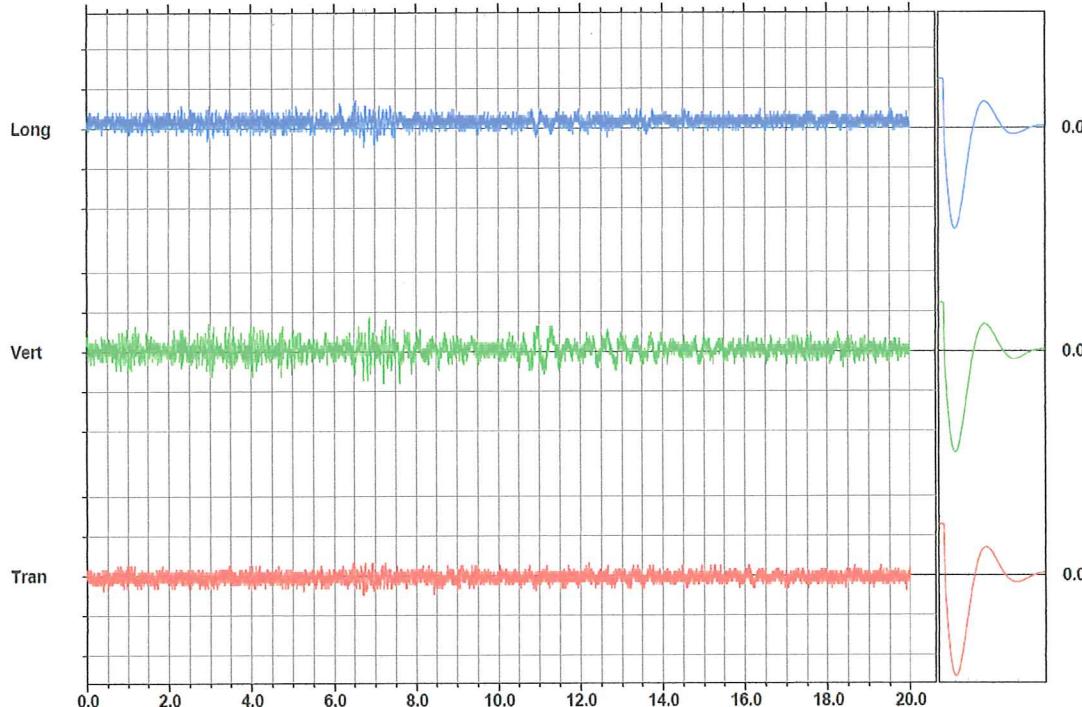
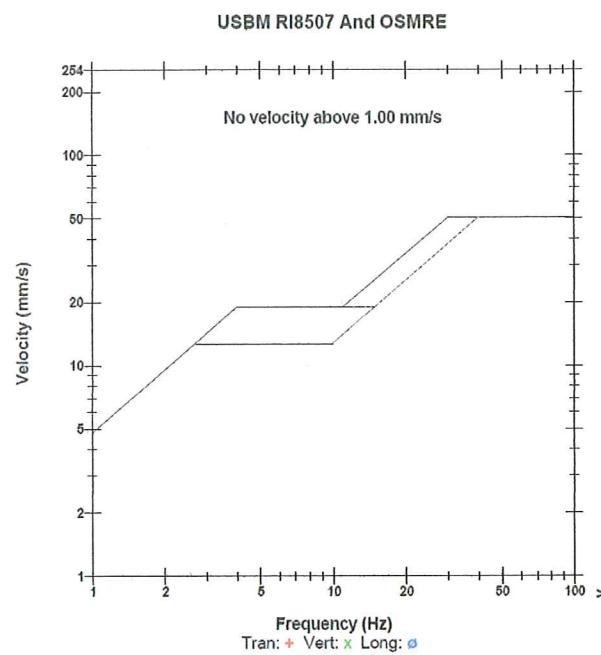
Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I61T.WM0

**Notes**  
 Location: SITIO 16 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.175	0.143	mm/s
PPV	30.6	35.8	34.1	dB
ZC Freq	28	14	14	Hz
Time (Rel. to Trig)	6.702	6.865	6.529	sec
Peak Acceleration	0.00829	0.00829	0.00663	g
Peak Displacement	0.00090	0.00529	0.00289	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.4	7.4	Hz
Overswing Ratio	3.7	3.8	3.9	

Peak Vector Sum 0.192 mm/s at 6.865 sec



Sensor Check



### Event Report

Date/Time Manual at 18:20:29 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 14

Notes  
 Location: SITIO 16 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

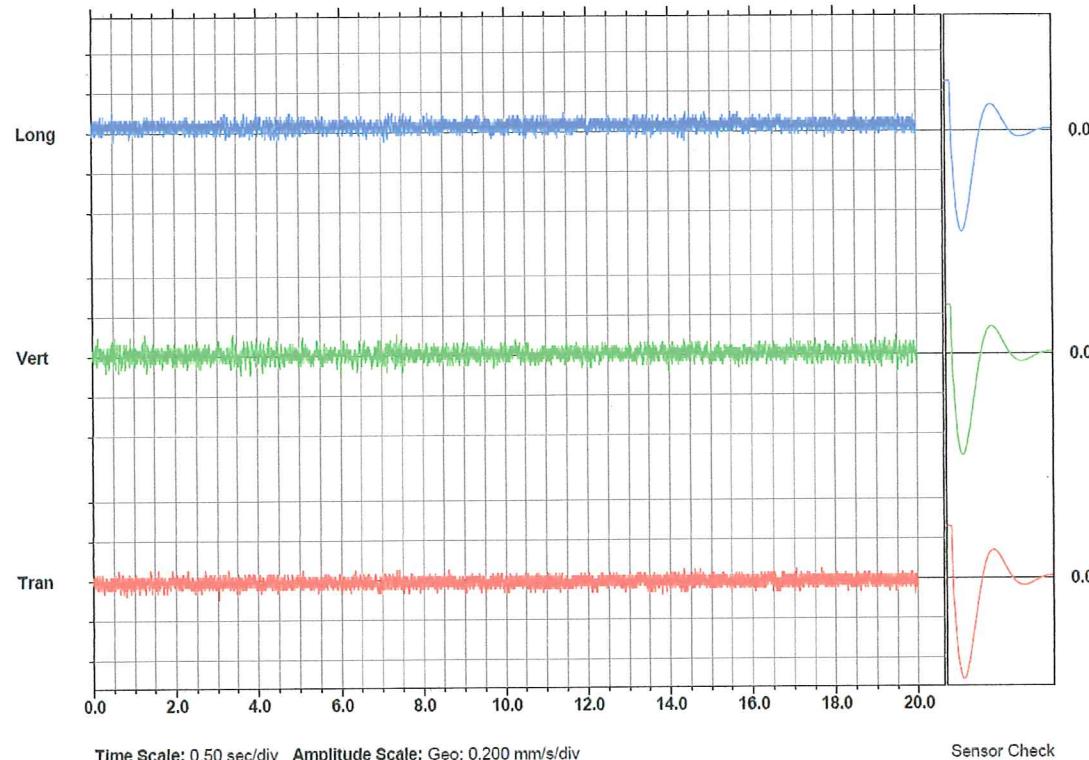
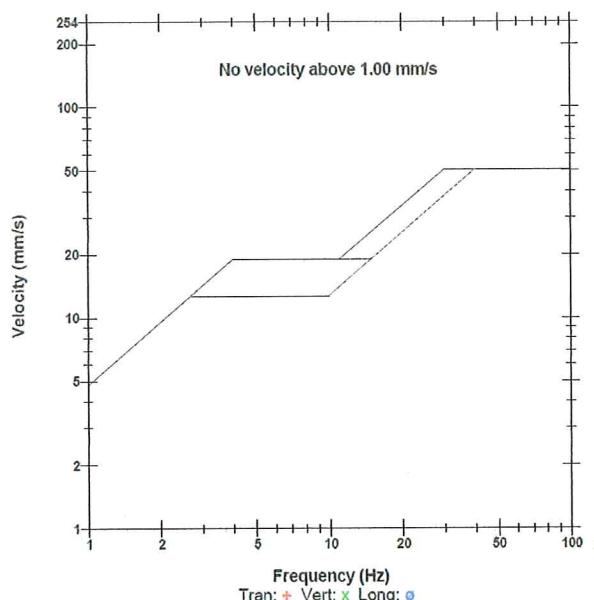
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.111	0.0952	mm/s
PPV	30.6	31.9	30.6	dB
ZC Freq	57	19	20	Hz
Time (Rel. to Trig)	3.019	1.277	0.511	sec
Peak Acceleration	0.00663	0.00663	0.00829	g
Peak Displacement	0.00064	0.00140	0.00221	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.7	3.7	3.9	

Peak Vector Sum 0.122 mm/s at 3.392 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052161U.Y50

#### USBM RI8507 And OSMRE



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check



**Event Report**

Date/Time Manual at 17:14:59 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

**Notes**  
 Location: SITIO 17 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO17

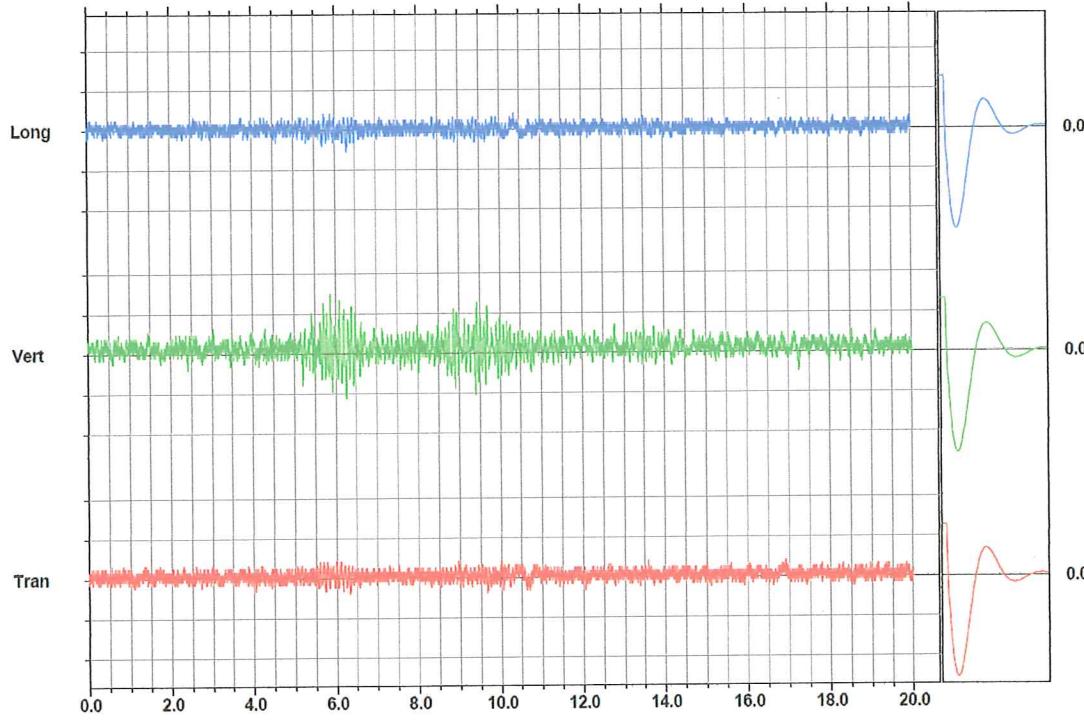
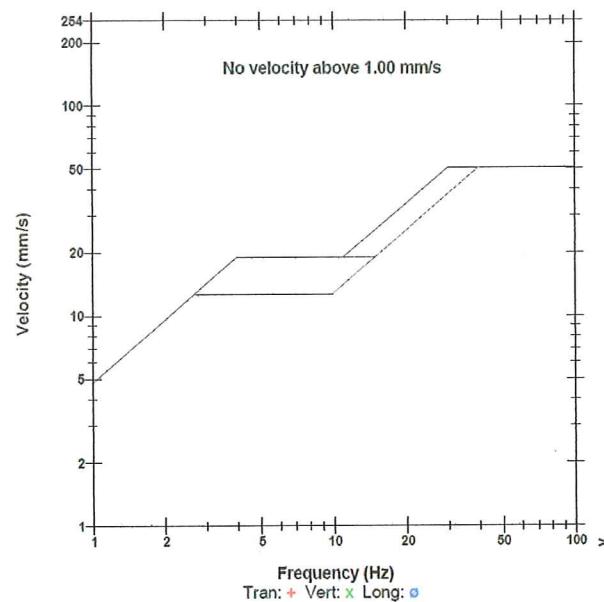
**Extended Notes**

	Tran	Vert	Long	
PPV	0.0794	0.302	0.111	mm/s
PPV	29.0	40.6	31.9	dB
ZC Freq	18	12	11	Hz
Time (Rel. to Trig)	5.590	5.877	6.296	sec
Peak Acceleration	0.00663	0.00663	0.00663	g
Peak Displacement	0.00093	0.00402	0.00141	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.5	7.7	Hz
Overswing Ratio	3.8	3.7	3.7	

Peak Vector Sum 0.305 mm/s at 5.877 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I61R.WZ0

**USBM RI8507 And OSMRE**



Sensor Check



**Event Report**

Date/Time Manual at 17:36:44 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

**Notes**

Location: SITIO 17 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO17

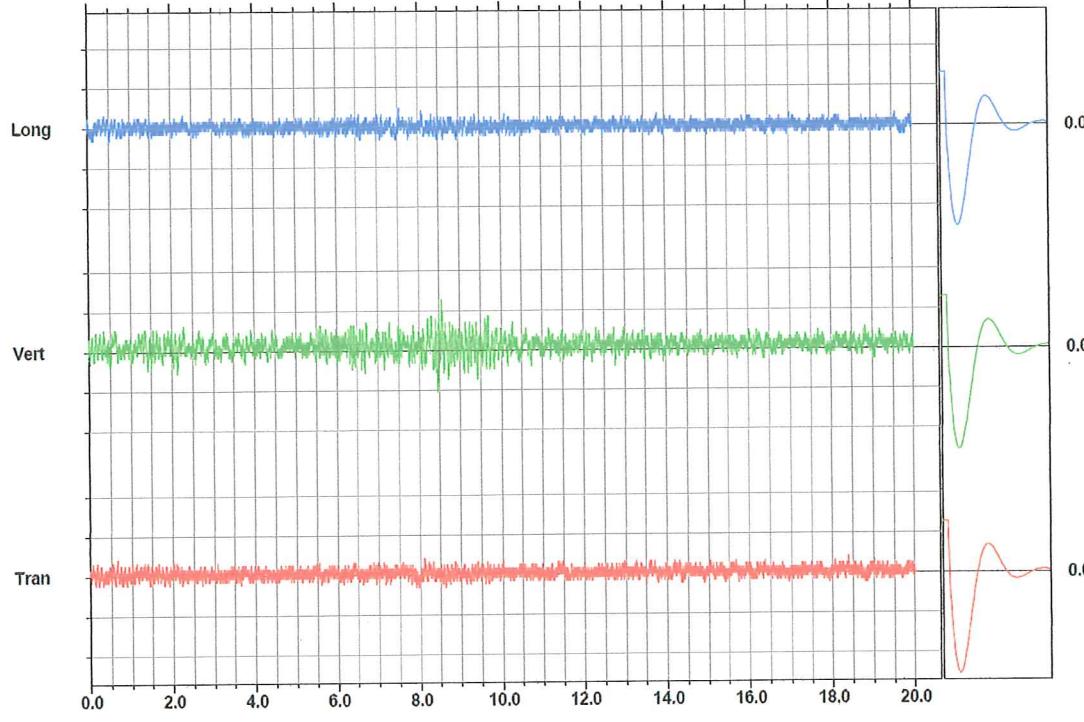
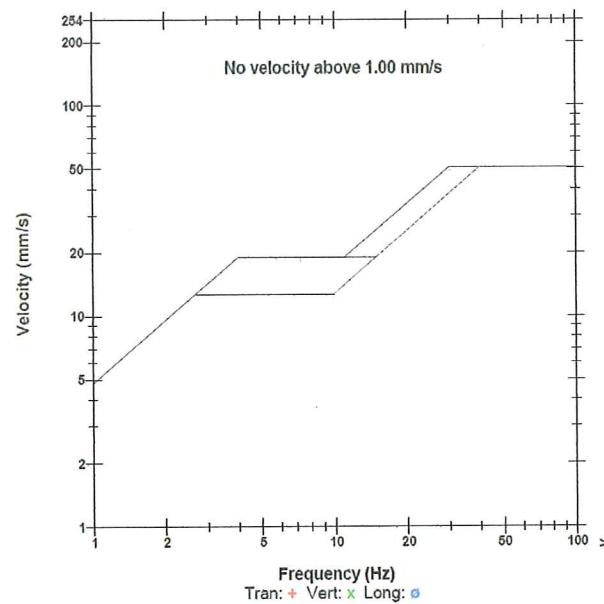
**Extended Notes**

	Tran	Vert	Long	
PPV	0.0794	0.254	0.0952	mm/s
PPV	29.0	39.1	30.6	dB
ZC Freq	18	9.5	30	Hz
Time (Rel. to Trig)	0.650	8.566	7.557	sec
Peak Acceleration	0.00663	0.00663	0.00663	g
Peak Displacement	0.00075	0.00397	0.00054	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.5	7.6	Hz
Overswing Ratio	3.8	3.7	3.7	

Peak Vector Sum 0.254 mm/s at 8.566 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579161S.X80

**USBM RI8507 And OSMRE**



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check



### Event Report

Date/Time Manual at 17:15:06 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 13

**Notes**  
 Location: SITIO 17 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

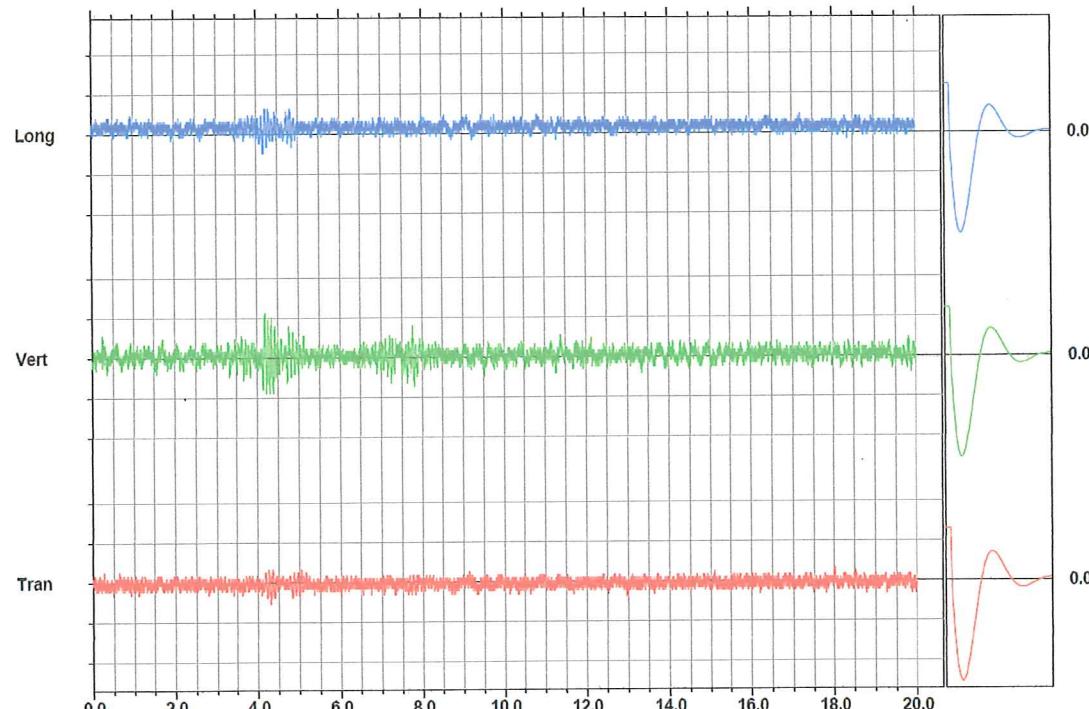
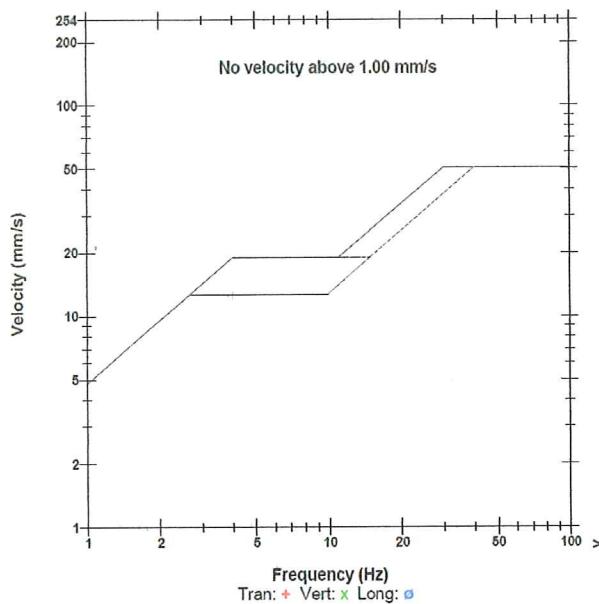
#### Extended Notes

	Tran	Vert	Long	
PPV	0.111	0.222	0.127	mm/s
PPV	31.9	37.9	33.1	dB
ZC Freq	12	11	10	Hz
Time (Rel. to Trig)	4.306	4.181	4.198	sec
Peak Acceleration	0.00829	0.00829	0.00829	g
Peak Displacement	0.00124	0.00298	0.00300	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.7	3.8	3.9	

Peak Vector Sum 0.223 mm/s at 4.181 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I61R.X60

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 17:36:48 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 13

Notes  
 Location: SITIO 17 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

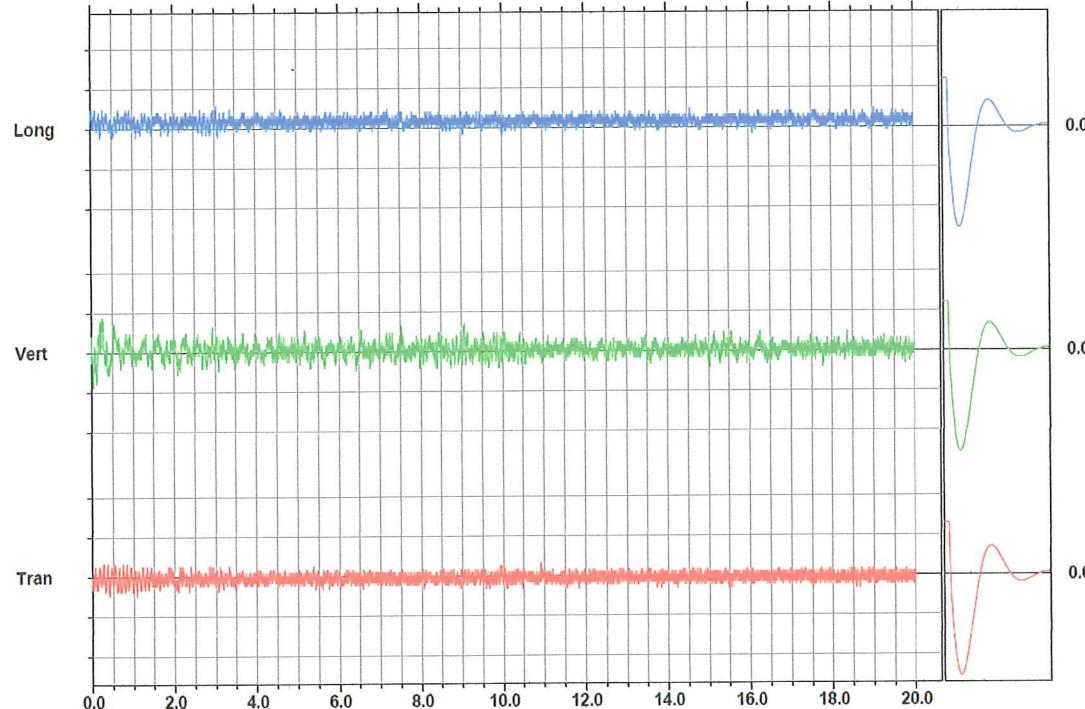
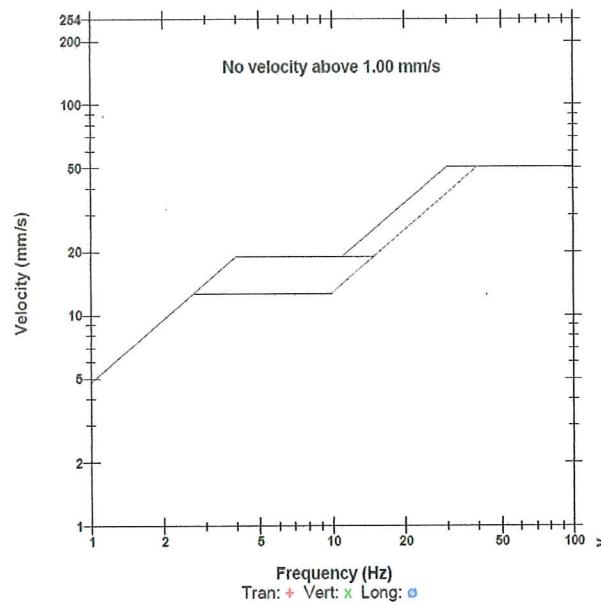
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.175	0.111	mm/s
PPV	30.6	35.8	31.9	dB
ZC Freq	16	11	10	Hz
Time (Rel. to Trig)	0.412	0.032	3.041	sec
Peak Acceleration	0.00663	0.00994	0.00829	g
Peak Displacement	0.00119	0.00434	0.00402	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.7	3.8	3.9	

Peak Vector Sum 0.192 mm/s at 0.274 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V0521G1S.XCO

#### USBM RI8507 And OSMRE



Sensor Check



**Event Report**

Date/Time Manual at 16:09:10 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

**Notes**  
 Location: SITIO 18 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO18

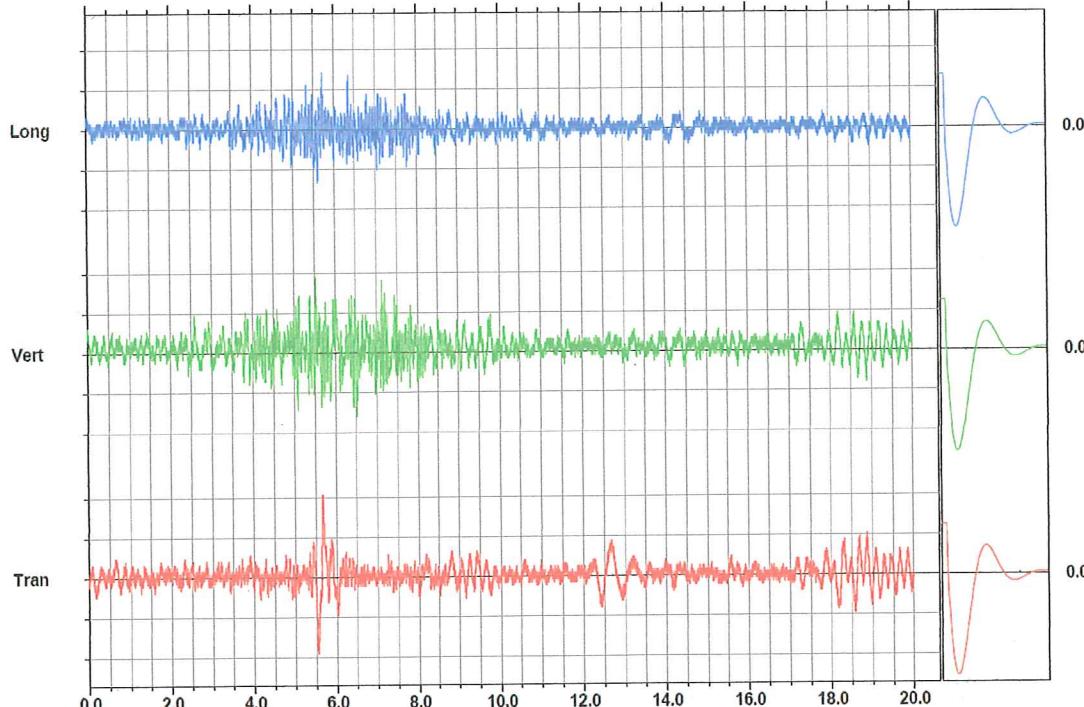
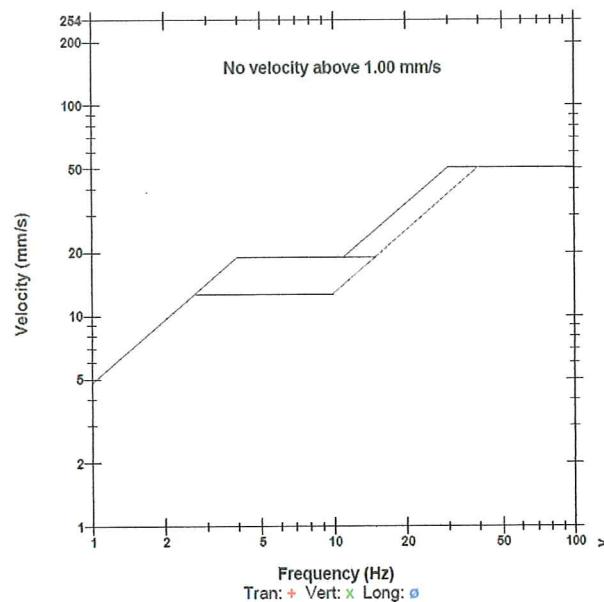
**Extended Notes**

	Tran	Vert	Long	
PPV	0.413	0.381	0.286	mm/s
PPV	43.3	42.6	40.1	dB
ZC Freq	4.0	10	10	Hz
Time (Rel. to Trig)	5.674	5.528	5.724	sec
Peak Acceleration	0.00829	0.00994	0.00994	g
Peak Displacement	0.0136	0.00685	0.00411	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.8	Hz
Overswing Ratio	3.7	3.7	3.6	

Peak Vector Sum 0.509 mm/s at 5.530 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I61O.VA0

**USBM RI8507 And OSMRE**



Sensor Check



**Event Report**

Date/Time Manual at 16:51:10 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

**Notes**  
 Location: SITIO 18 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO18

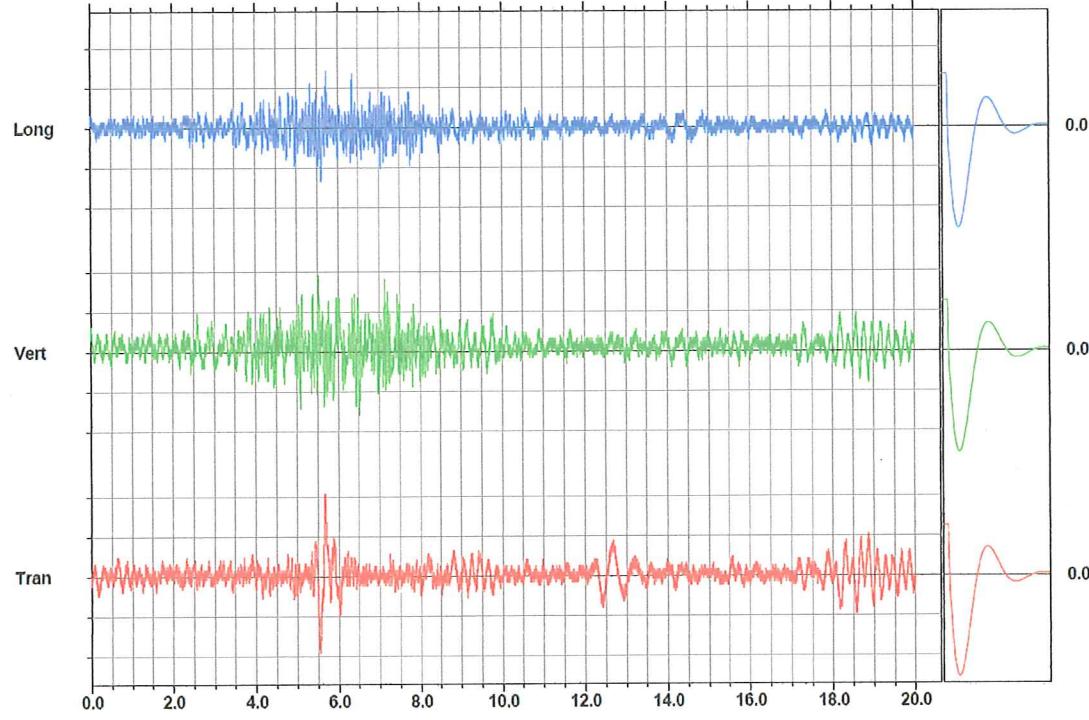
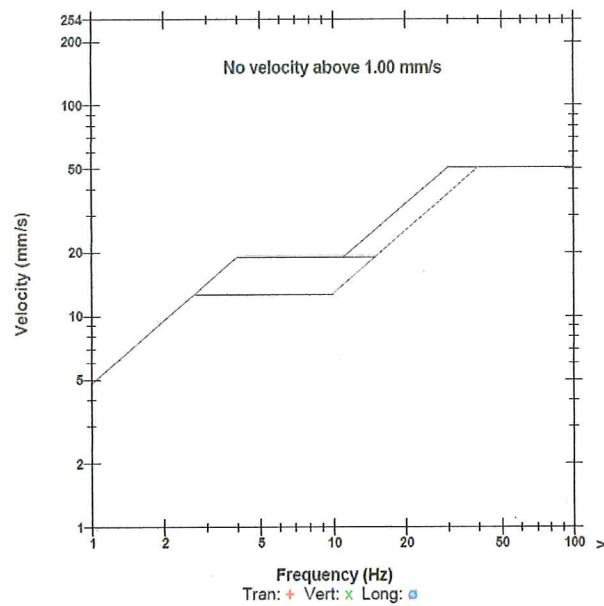
**Extended Notes**

	Tran	Vert	Long	
PPV	0.313	0.381	0.286	mm/s
PPV	43.3	42.6	40.1	dB
ZC Freq	4.0	10	10	Hz
Time (Rel. to Trig)	5.674	5.528	5.724	sec
Peak Acceleration	0.00829	0.00994	0.00994	g
Peak Displacement	0.0136	0.00685	0.00411	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.8	Hz
Overswing Ratio	3.7	3.7	3.6	

Peak Vector Sum 0.509 mm/s at 5.530 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579161OO.VAO

**USBM RI8507 And OSMRE**



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check



### Event Report

Date/Time Manual at 16:29:55 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 12

Notes  
 Location: SITIO 18 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

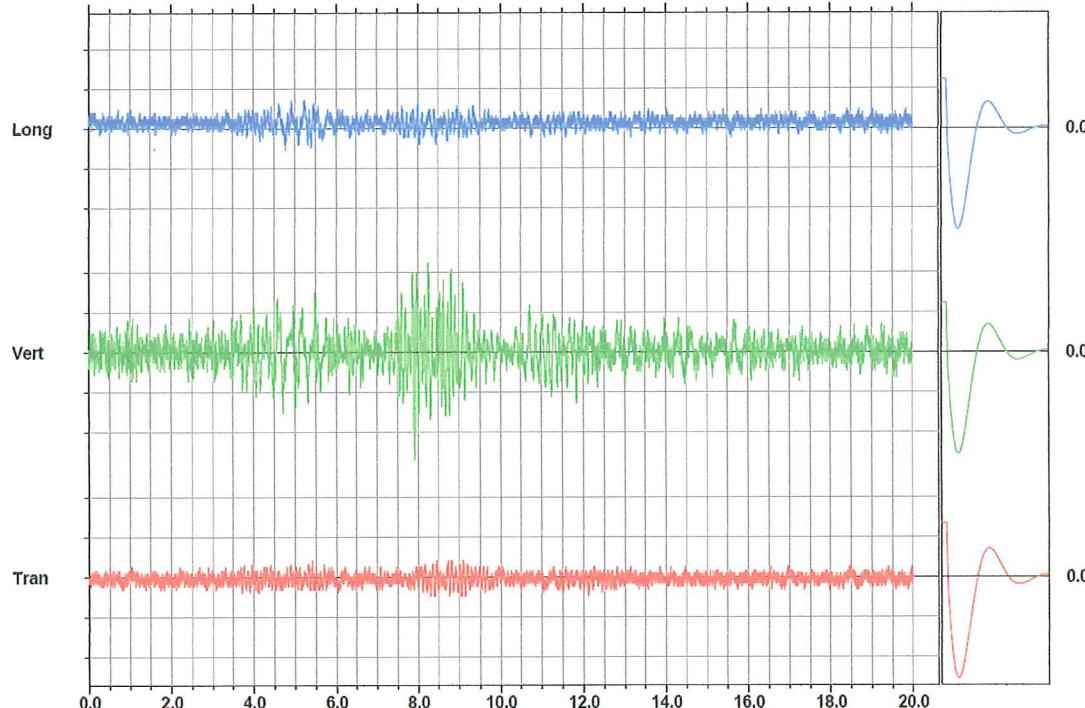
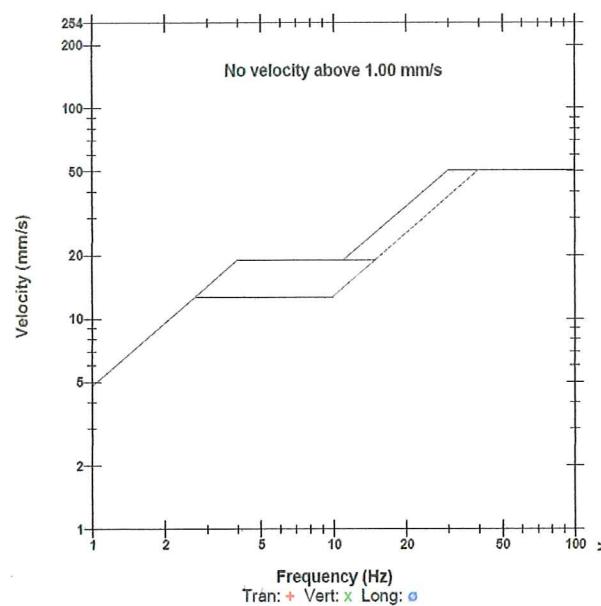
#### Extended Notes

PPV	0.0952	Tran	0.540	Vert	0.143	Long		mm/s
PPV	30.6		45.6		34.1			dB
ZC Freq	12		11		6.2			Hz
Time (Rel. to Trig)	8.289		7.920		4.919			sec
Peak Acceleration	0.00663		0.00829		0.00663			g
Peak Displacement	0.00112		0.00909		0.00361			mm
Sensor Check	Passed	Passed	Passed					
Frequency	7.3		7.4		7.4			Hz
Overswing Ratio	3.7		3.7		3.9			

Peak Vector Sum 0.542 mm/s at 7.920 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052161P.TVO

#### USBM RI8507 And OSMRE



Sensor Check



## Event Report

Date/Time Manual at 16:51:52 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 12

Notes  
 Location: SITIO 18 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

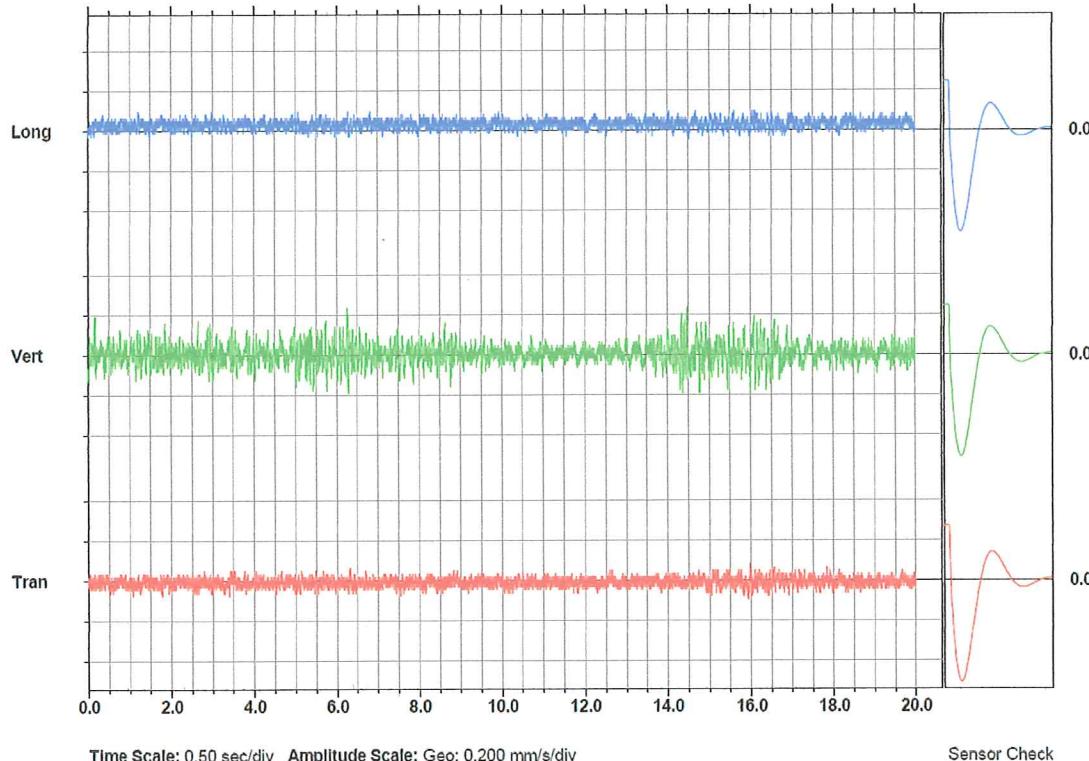
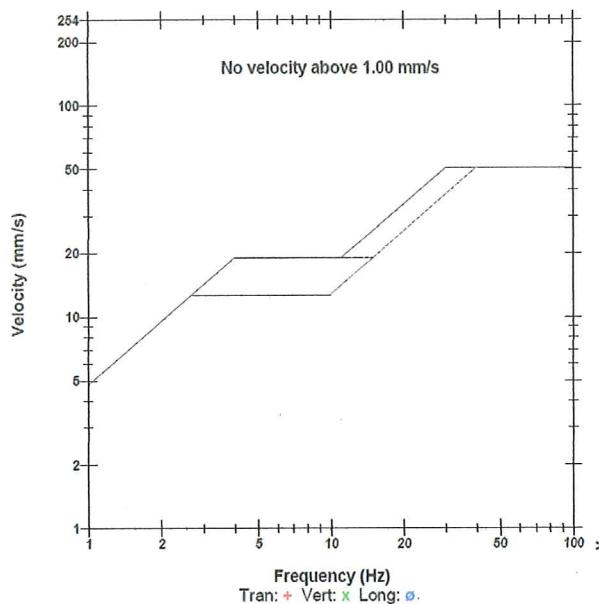
### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.238	0.0952	mm/s
PPV	30.6	38.5	30.6	dB
ZC Freq	11	15	14	Hz
Time (Rel. to Trig)	15.922	6.257	1.218	sec
Peak Acceleration	0.00829	0.00829	0.00829	g
Peak Displacement	0.00132	0.00357	0.00236	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.7	3.7	3.9	

Peak Vector Sum 0.247 mm/s at 6.257 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I61Q.UG0

### USBM RI8507 And OSMRE



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check



## Event Report

Date/Time Manual at 15:47:04 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 19 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO19

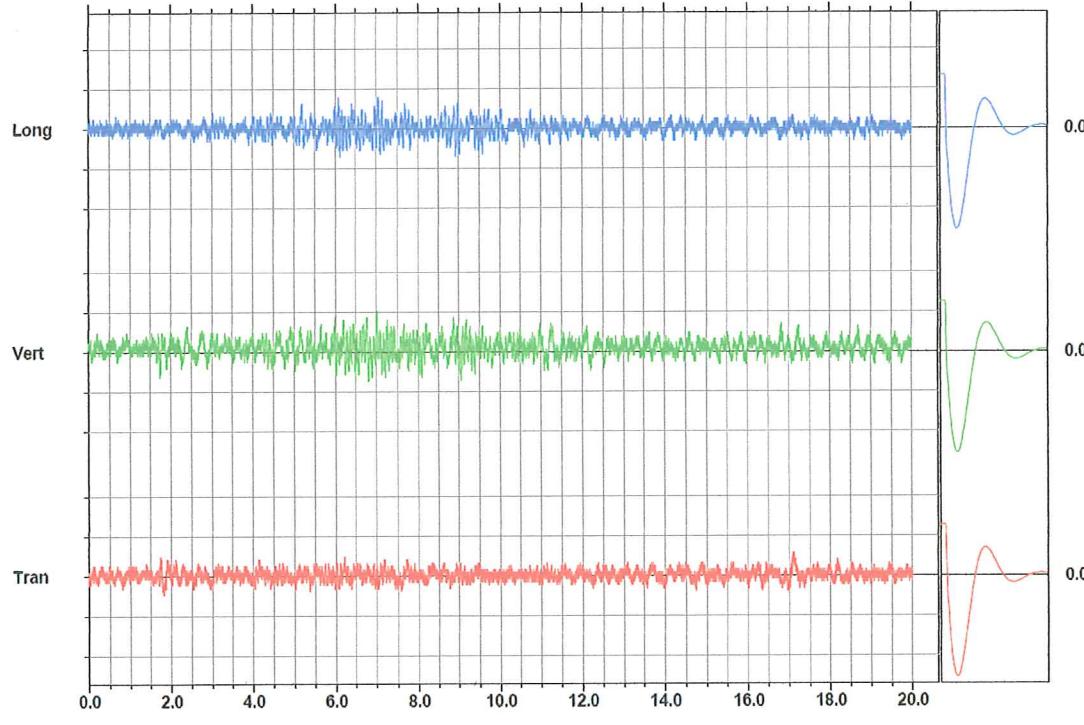
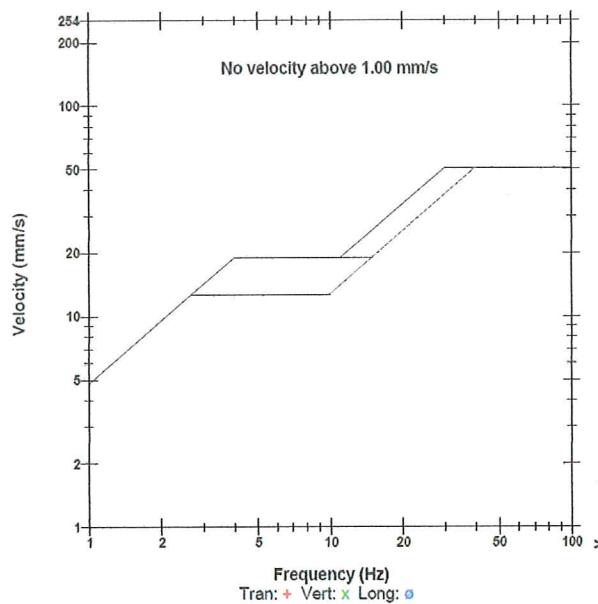
### Extended Notes

	Tran	Vert	Long	
PPV	0.111	0.206	0.159	mm/s
PPV	31.9	37.3	35.0	dB
ZC Freq	4.9	11	12	Hz
Time (Rel. to Trig)	17.090	7.016	6.077	sec
Peak Acceleration	0.00663	0.00663	0.00829	g
Peak Displacement	0.00361	0.00508	0.00236	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.8	7.6	7.7	
Overswing Ratio	3.7	3.6	3.6	

Peak Vector Sum 0.222 mm/s at 7.016 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I61N.UG0

### USBM RI8507 And OSMRE



Sensor Check

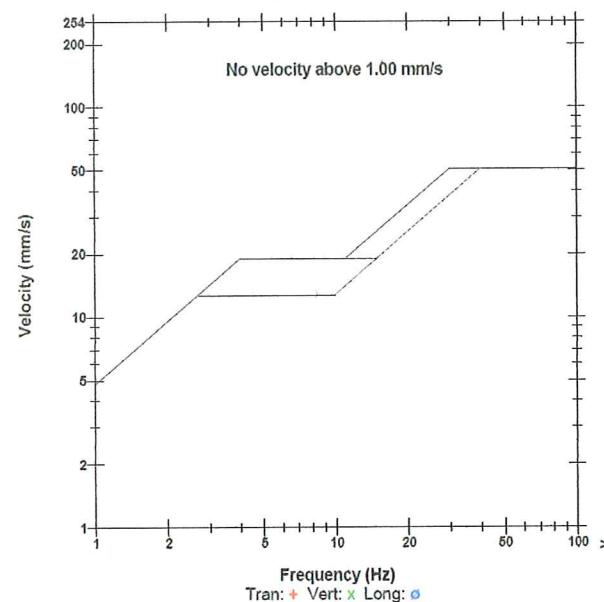


### Event Report

Date/Time Manual at 16:09:10 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1  
**Notes**  
 Location: SITIO 19 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO19

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I610.VA0

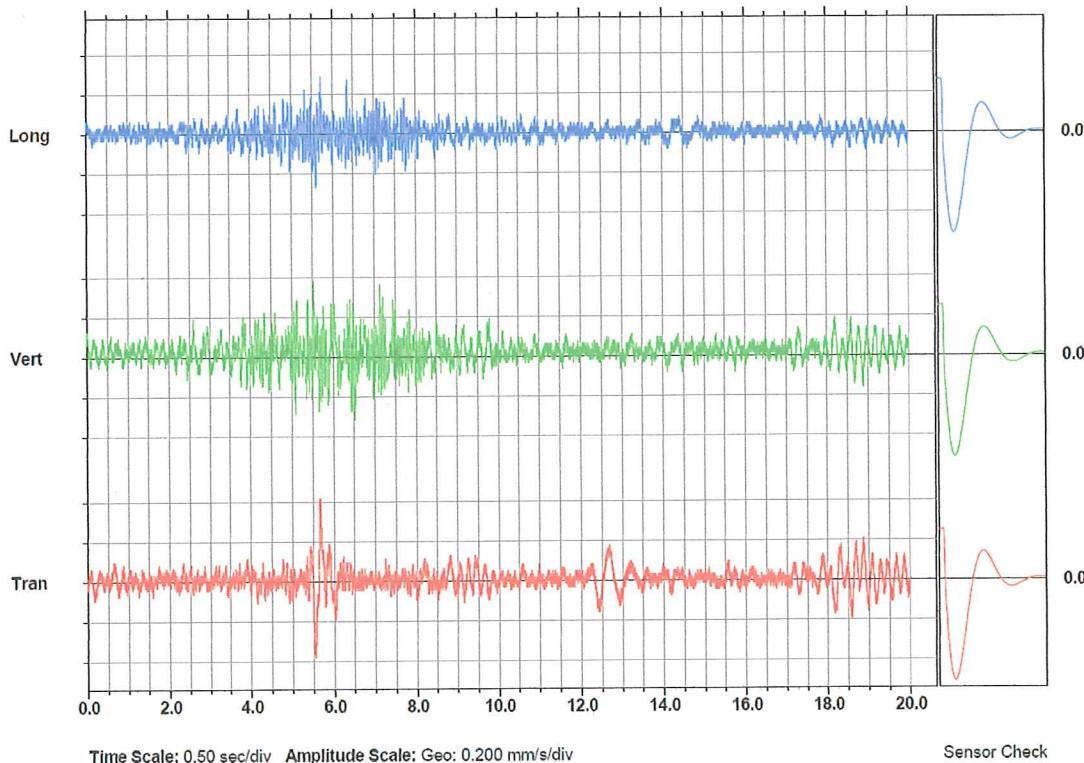
#### USBM RI8507 And OSMRE



#### Extended Notes

	Tran	Vert	Long	
PPV	0.413	0.381	0.286	mm/s
PPV	43.3	42.6	40.1	dB
ZC Freq	4.0	10	10	Hz
Time (Rel. to Trig)	5.674	5.528	5.724	sec
Peak Acceleration	0.00829	0.00994	0.00994	g
Peak Displacement	0.0136	0.00685	0.00411	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.8	Hz
Overswing Ratio	3.7	3.7	3.6	
Peak Vector Sum	0.509	mm/s at 5.530 sec		

Peak Vector Sum 0.509 mm/s at 5.530 sec



Sensor Check



### Event Report

Date/Time Manual at 15:47:20 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps

Job Number: 11

Notes

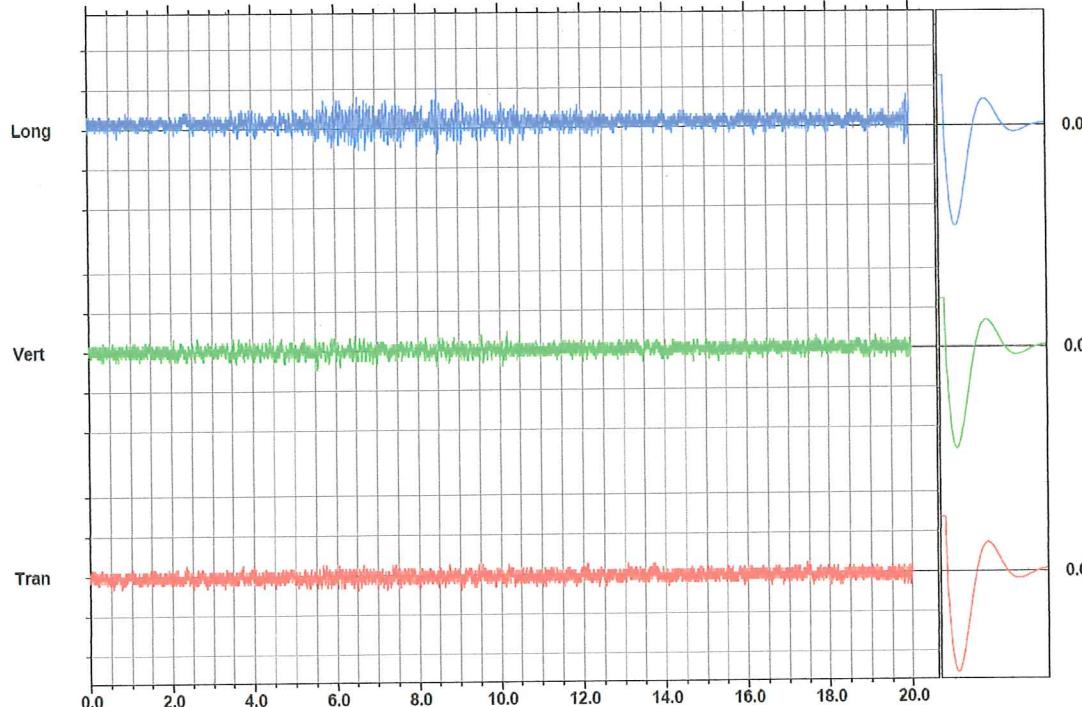
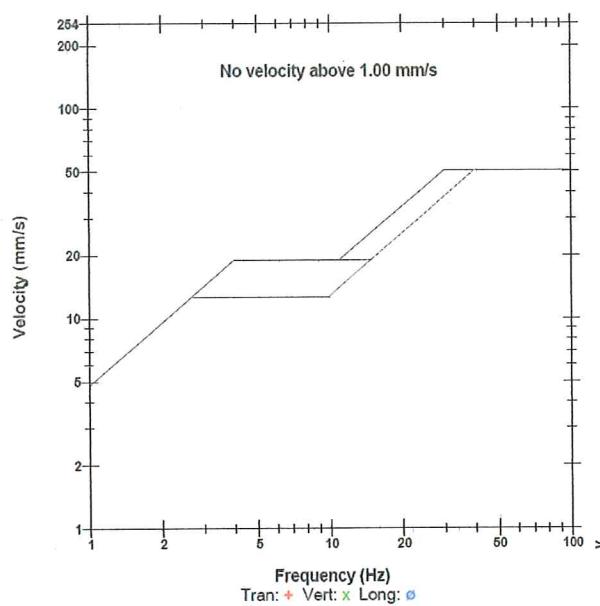
Location: SITIO 19 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.0952	0.190	mm/s
PPV	29.0	30.6	36.6	dB
ZC Freq	26	20	14	Hz
Time (Rel. to Trig)	6.506	5.553	8.490	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00050	0.00091	0.00301	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.3	7.4	7.4	
Overswing Ratio	3.6	3.7	3.9	
Peak Vector Sum	0.191 mm/s at 8.490 sec			

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I61N.UW0

#### USBM RI8507 And OSMRE



Sensor Check

**Instantel**
**Event Report**

Date/Time Manual at 16:09:22 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 11

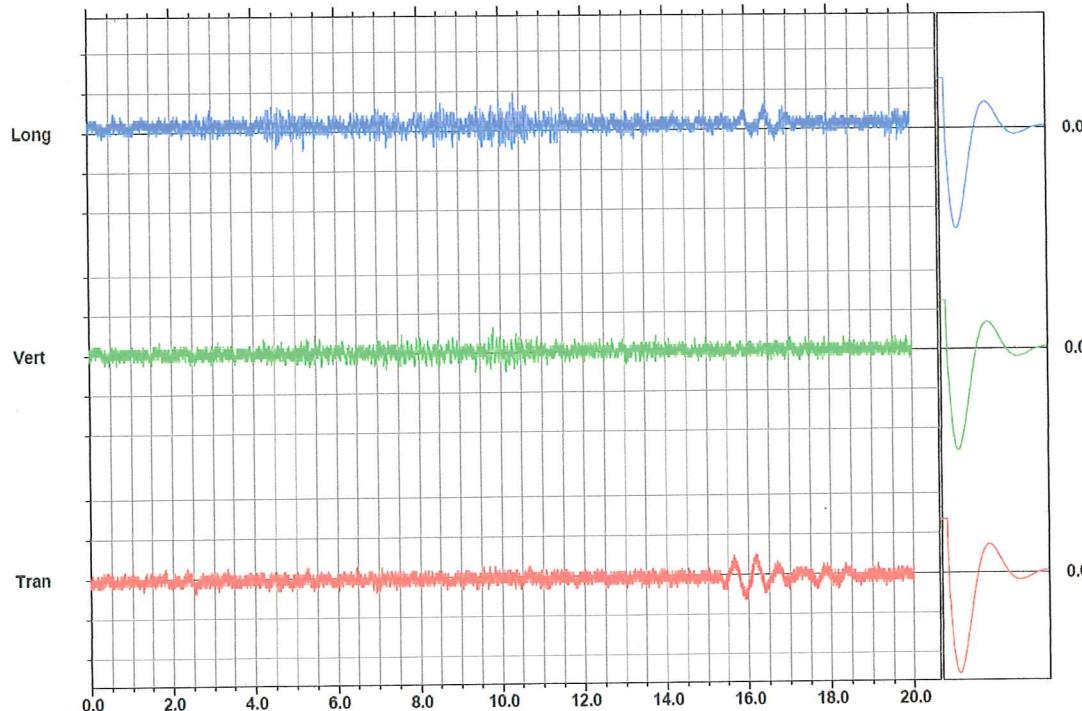
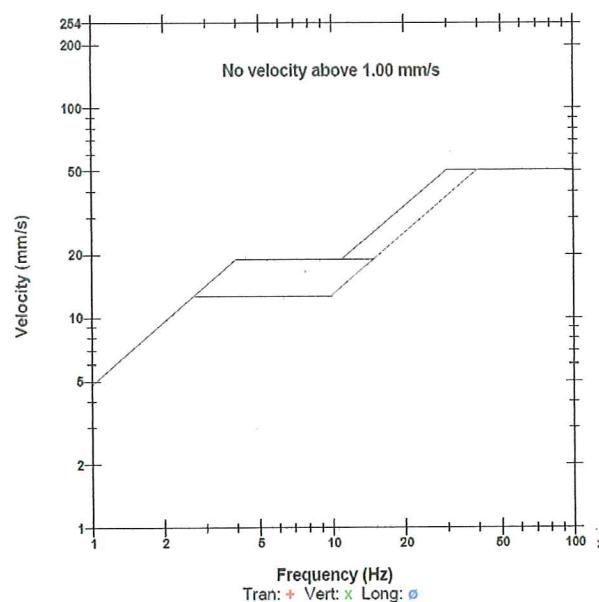
Notes  
 Location: SITIO LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

**Extended Notes**

	Tran	Vert	Long	
PPV	0.127	0.127	0.190	mm/s
PPV	33.1	33.1	36.6	dB
ZC Freq	2.0	19	13	Hz
Time (Rel. to Trig)	15.904	9.824	10.360	sec
Peak Acceleration	0.00663	0.00829	0.00829	g
Peak Displacement	0.0102	0.00102	0.00614	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.3	7.4	7.4	
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.191 mm/s at 10.360 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I61O.VMO

**USBM RI8507 And OSMRE**


Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check



**Event Report**

Date/Time Manual at 13:43:27 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

**Notes**  
 Location: SITIO 20 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO20

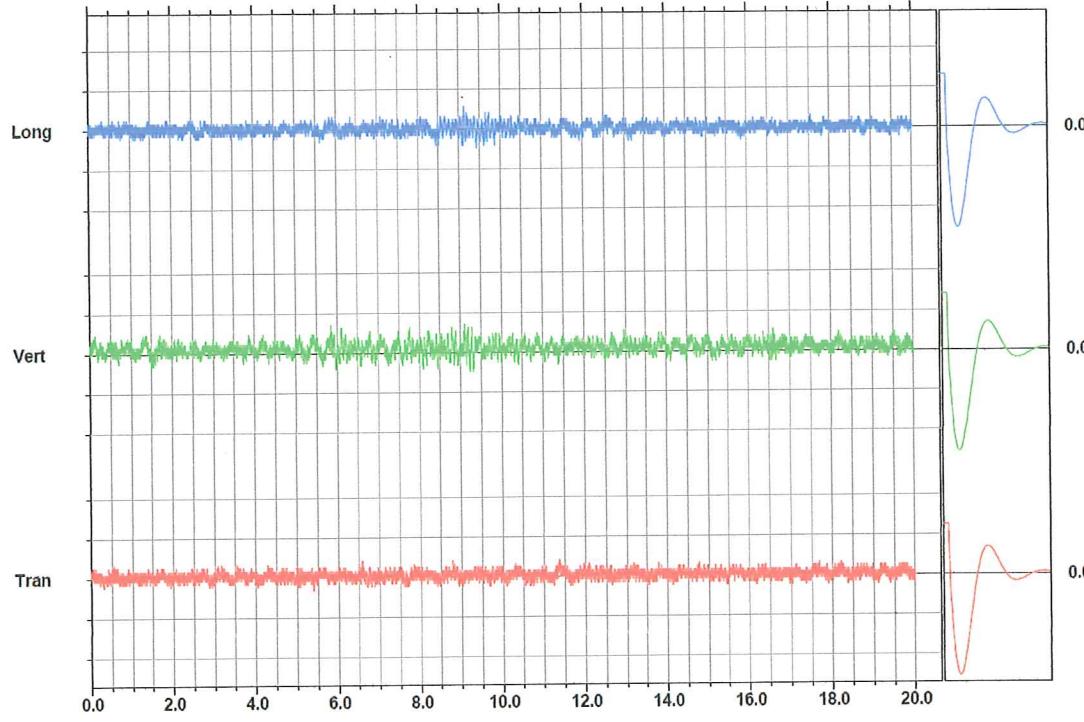
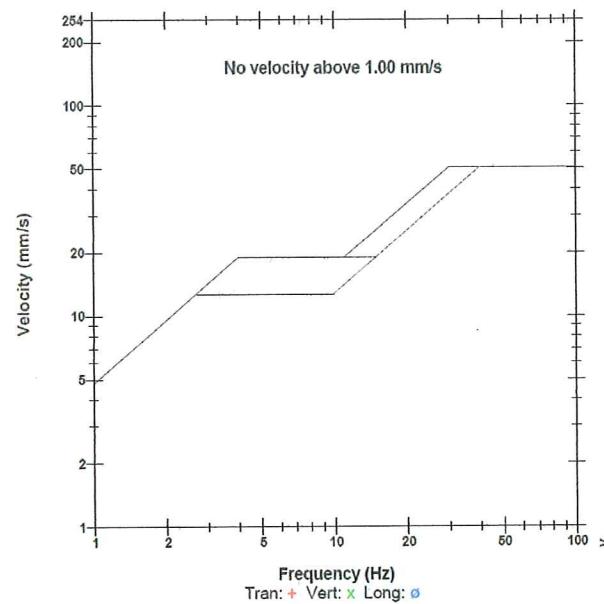
**Extended Notes**

	Tran	Vert	Long	
PPV	0.0794	0.143	0.111	mm/s
PPV	29.0	34.1	31.9	dB
ZC Freq	>100	8.4	15	Hz
Time (Rel. to Trig)	6.571	5.861	9.123	sec
Peak Acceleration	0.00829	0.00663	0.00663	g
Peak Displacement	0.00047	0.00369	0.00119	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.5	7.7	Hz
Overswing Ratio	3.7	3.6	3.6	

Peak Vector Sum 0.156 mm/s at 9.098 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I611.4F0

**USBM RI8507 And OSMRE**



Sensor Check



### Event Report

Date/Time Manual at 13:59:32 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 20 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO20

#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.222	0.0794	mm/s
PPV	29.0	37.9	29.0	dB
ZC Freq	16	16	39	Hz
Time (Rel. to Trig)	7.393	7.196	3.110	sec
Peak Acceleration	0.00829	0.00663	0.00663	g
Peak Displacement	0.00081	0.00822	0.00102	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.8	7.6	7.8	
Overswing Ratio	3.8	3.6	3.6	

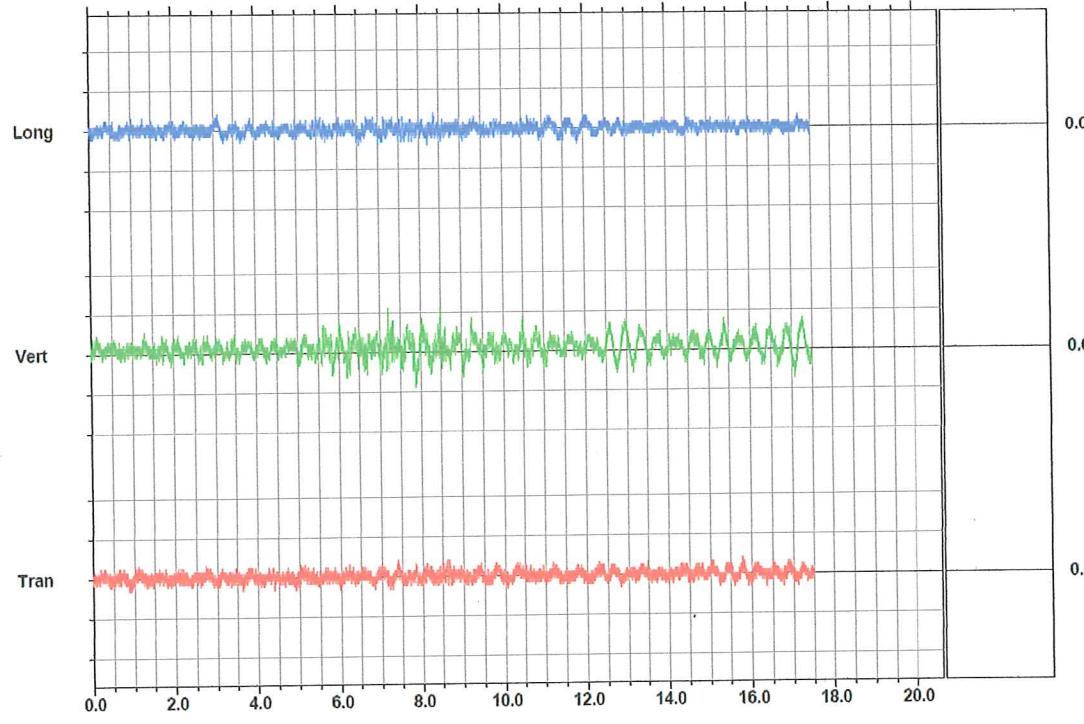
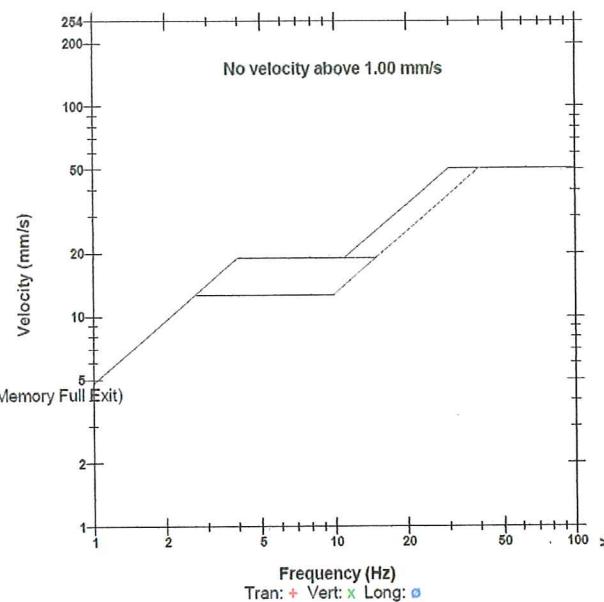
Peak Vector Sum 0.227 mm/s at 8.487 sec

#### Monitor Log

Oct 24 /19 13:44:29 Oct 24 /19 13:59:49 Event recorded. (Memory Full Exit)

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I611.V80

#### USBM RI8507 And OSMRE



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check



**Event Report**

Date/Time Manual at 13:43:20 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 11

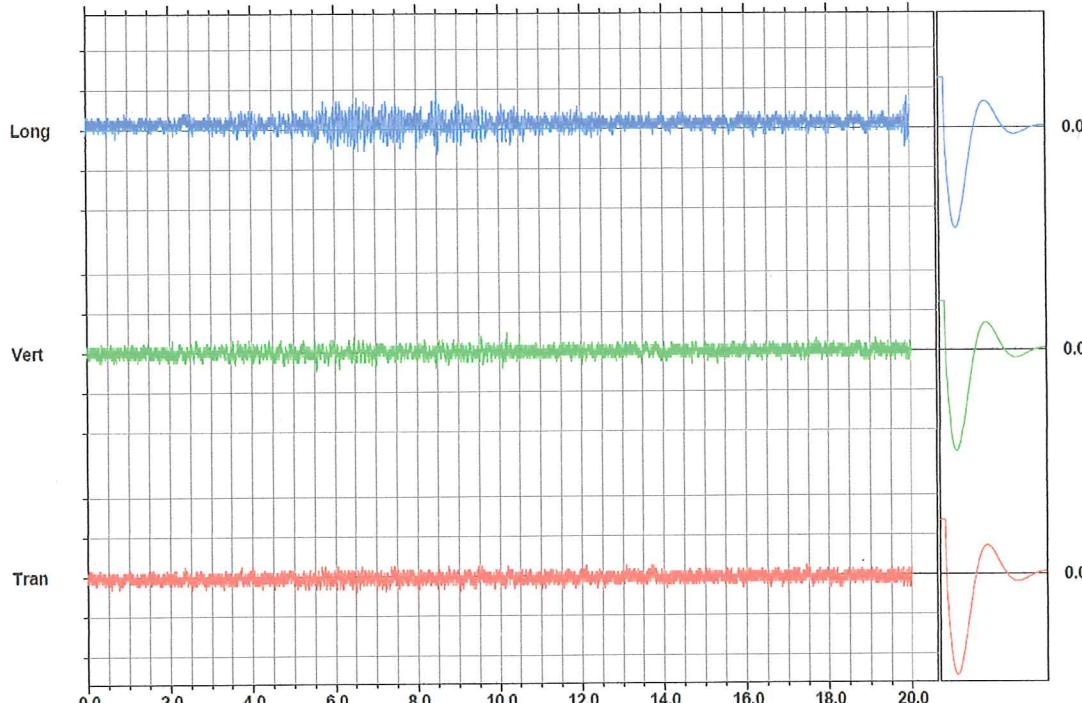
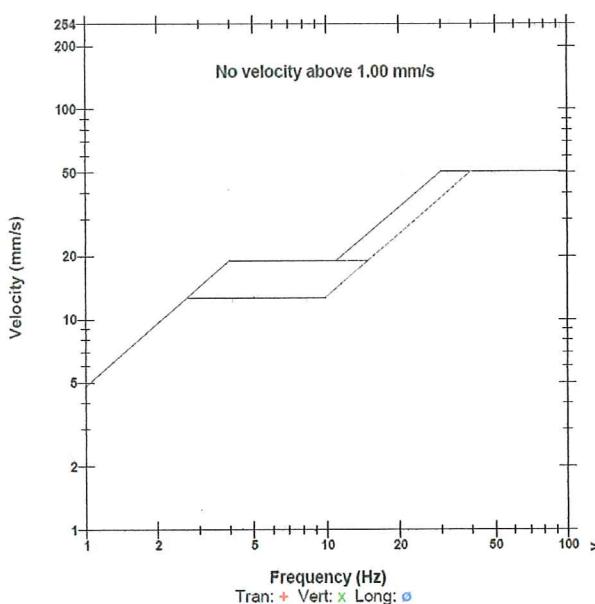
Notes  
 Location: SITIO 20 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.0952	0.190	mm/s
PPV	29.0	30.6	36.6	dB
ZC Freq	26	20	14	Hz
Time (Rel. to Trig)	6.506	5.553	8.490	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00050	0.00091	0.00301	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.3	7.4	7.4	
Overswing Ratio	3.6	3.7	3.9	
Peak Vector Sum	0.191 mm/s at 8.490 sec			

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I61NN.UW0

**USBM RI8507 And OSMRE**



Sensor Check



### Event Report

Date/Time Manual at 13:59:10 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 11

Notes  
 Location: SITIO 20 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

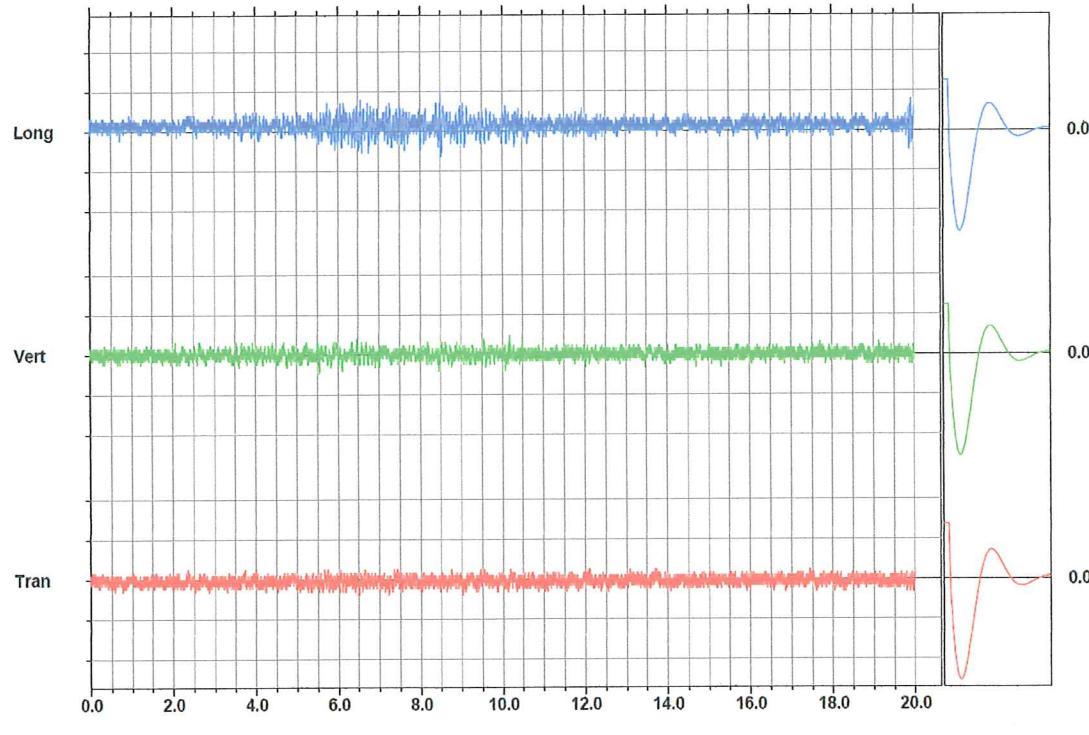
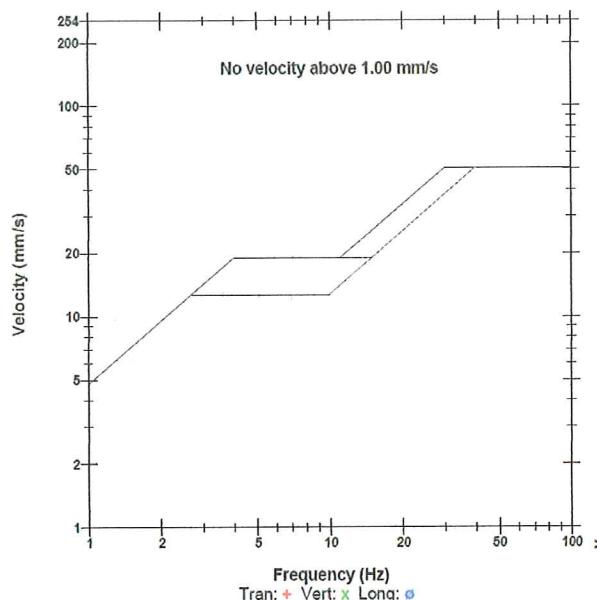
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0694	0.0852	0.190	mm/s
PPV	29.0	30.6	36.6	dB
ZC Freq	26	20	14	Hz
Time (Rel. to Trig)	6.506	5.553	8.490	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00050	0.00091	0.00301	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.191 mm/s at 8.490 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I61NO.UW0

#### USBM RI8507 And OSMRE



Sensor Check



## Event Report

Date/Time Manual at 13:11:08 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps

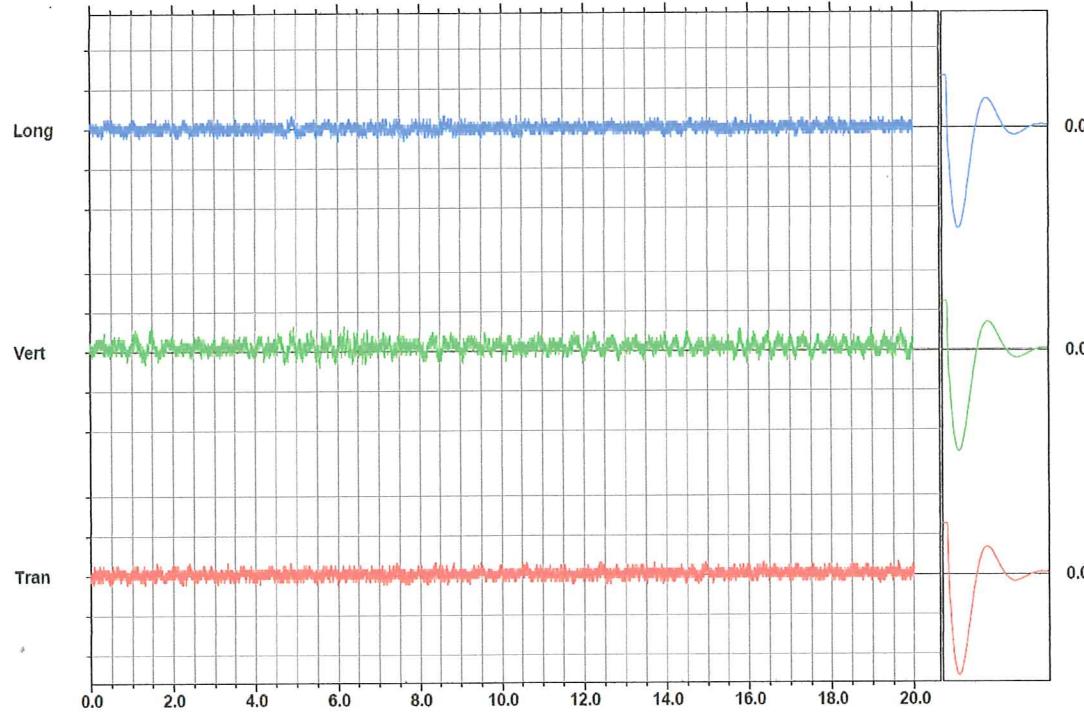
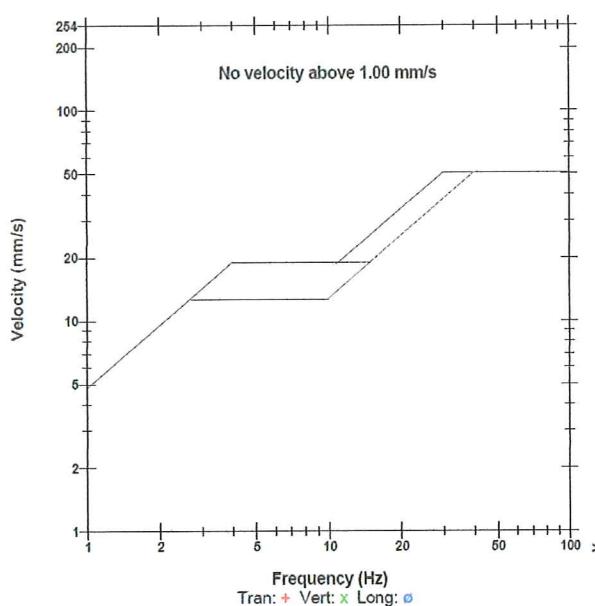
Job Number: 1  
 Notes  
 Location: SITIO 21 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO21

### Extended Notes

	Tran	Vert	Long	
PPV	0.0635	0.127	0.0635	mm/s
PPV	27.1	33.1	27.1	dB
ZC Freq	>100	5.2	39	Hz
Time (Rel. to Trig)	1.598	1.494	4.888	sec
Peak Acceleration	0.00663	0.00663	0.00829	g
Peak Displacement	0.00029	0.00359	0.00053	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.7	Hz
Overswing Ratio	3.8	3.6	3.6	
Peak Vector Sum	0.131 mm/s at 1.494 sec			

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name Q579I61G.MK0

### USBM RI8507 And OSMRE



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check



## Event Report

Date/Time Manual at 13:23:10 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 21 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO21

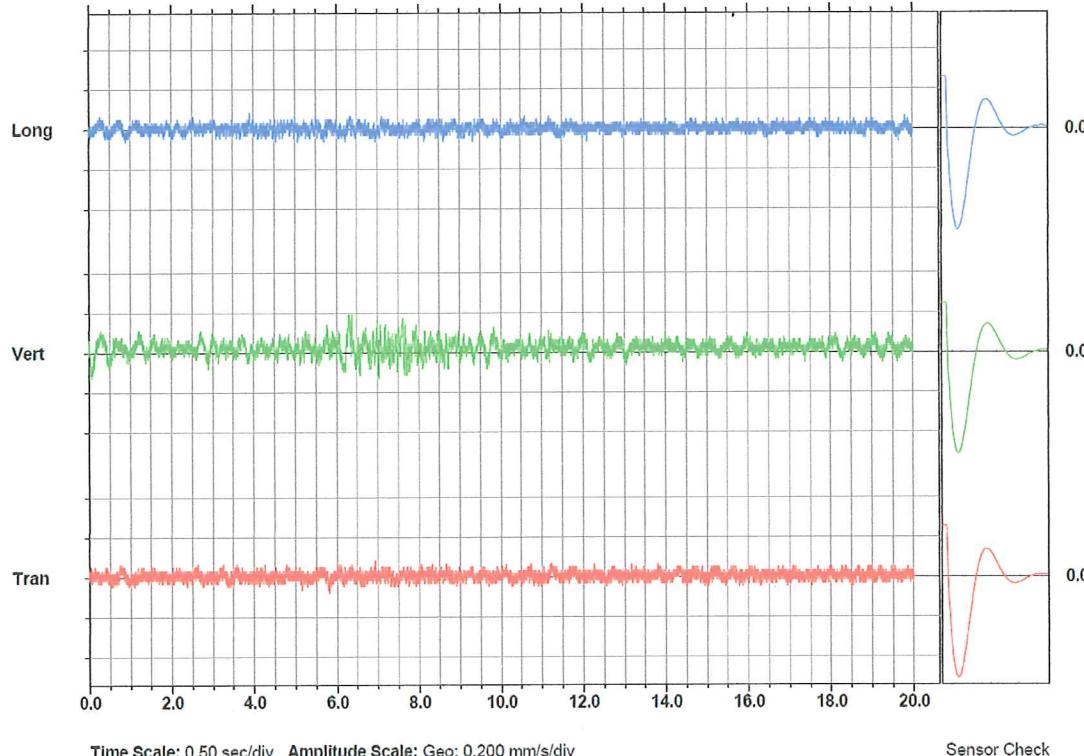
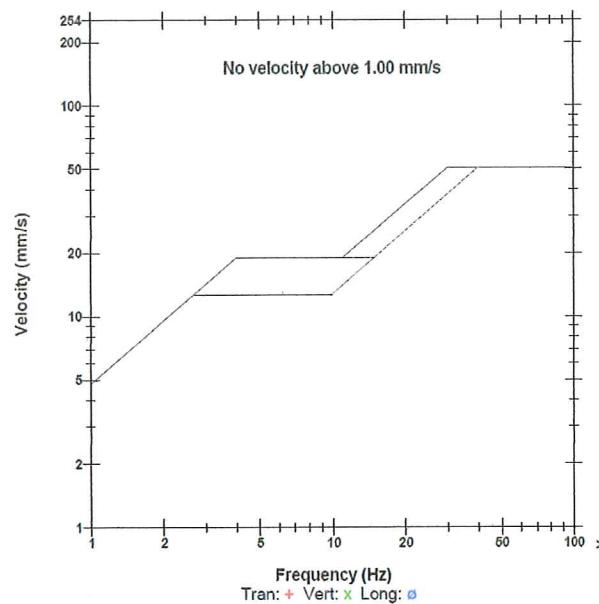
### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.190	0.0794	mm/s
PPV	29.0	36.6	29.0	dB
ZC Freq	24	4.6	30	Hz
Time (Rel. to Trig)	5.805	6.296	3.910	sec
Peak Acceleration	0.00663	0.00663	0.00663	g
Peak Displacement	0.00064	0.00630	0.00064	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.6	7.7	Hz
Overswing Ratio	3.8	3.6	3.6	

Peak Vector Sum 0.199 mm/s at 6.310 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I61H.6M0

### USBM RI8507 And OSMRE





### Event Report

Date/Time Manual at 13:10:12 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 9

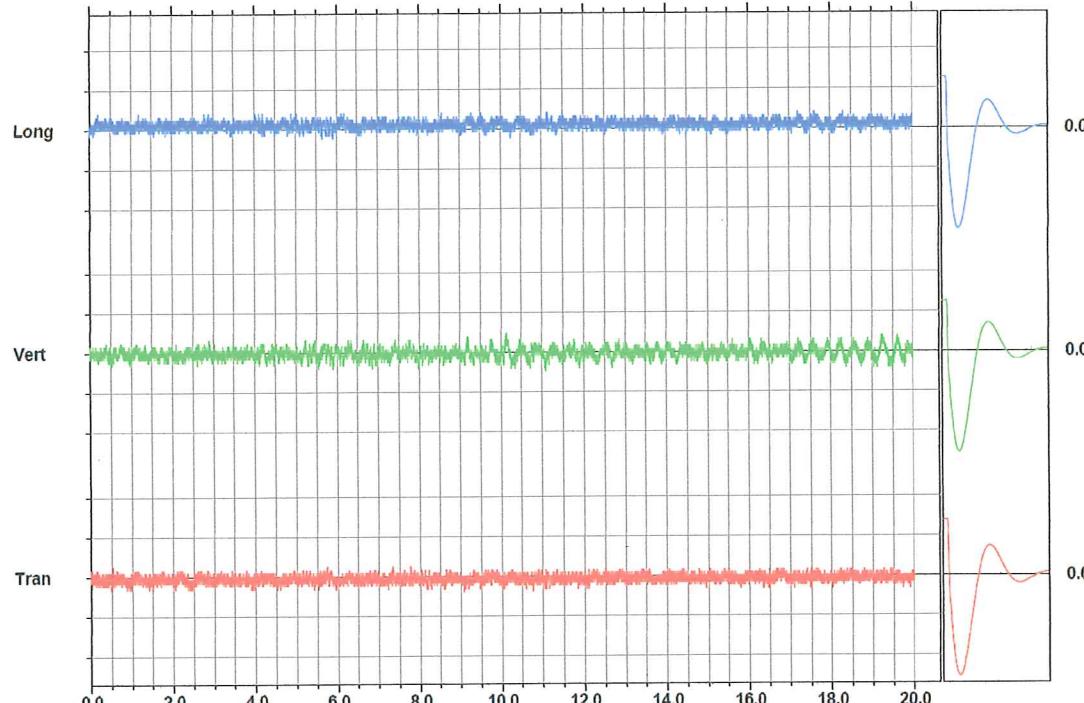
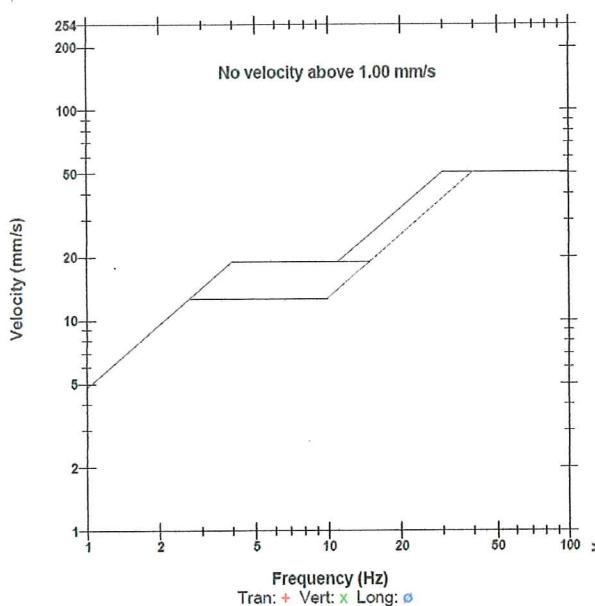
Notes  
 Location: SITIO 21 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

#### Extended Notes

	Tran	Vert	Long	mm/s
PPV	0.0794	0.0952	0.0794	
PPV	29.0	30.6	29.0	dB
ZC Freq	>100	7.4	73	Hz
Time (Rel. to Trig)	9.072	10.127	0.189	sec
Peak Acceleration	0.00829	0.00829	0.00829	g
Peak Displacement	0.00053	0.00336	0.00119	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.5	3.6	3.8	
Peak Vector Sum	0.104 mm/s at 12.688 sec			

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.6 Volts  
 File Name V052I61G.L00

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 13:22:13 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 9

Notes  
 Location: SITIO 21 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

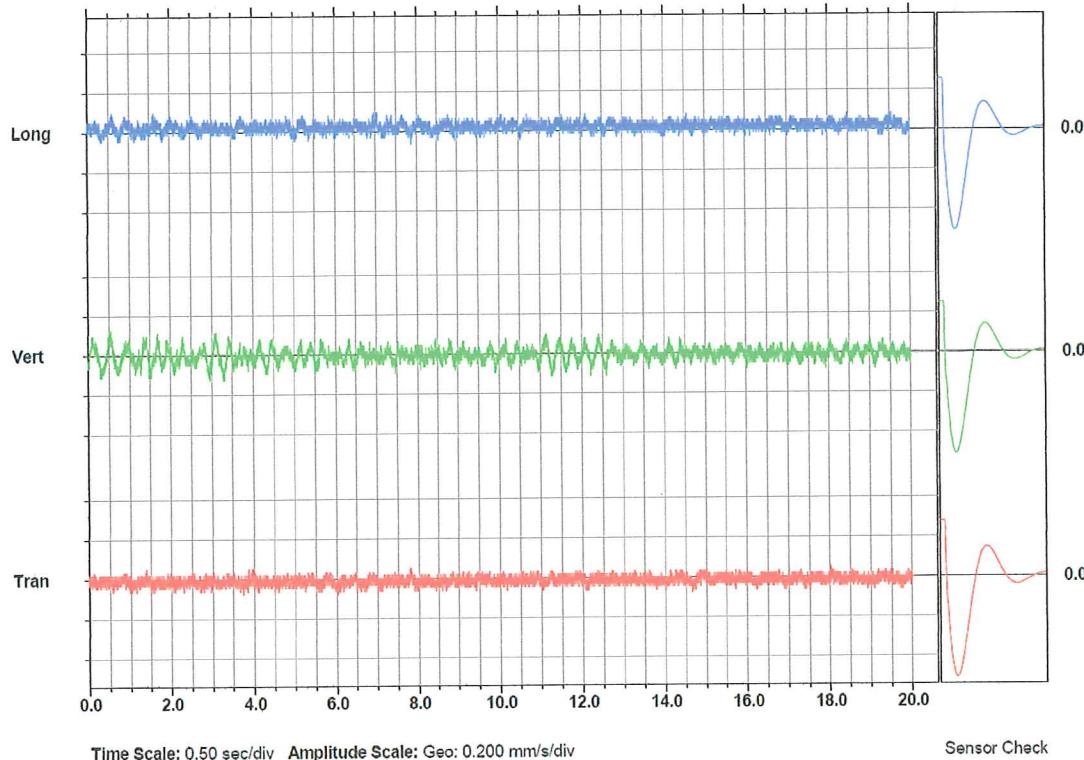
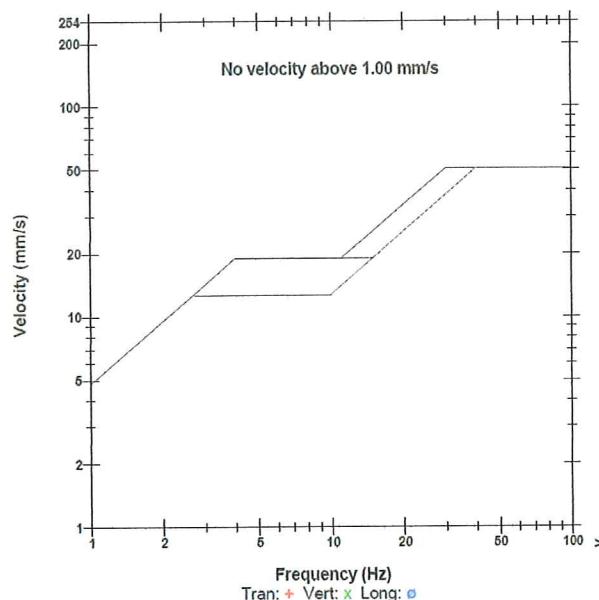
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.127	0.0952	mm/s
PPV	29.0	33.1	30.6	dB
ZC Freq	20	4.0	8.1	Hz
Time (Rel. to Trig)	3.730	0.508	0.592	sec
Peak Acceleration	0.00829	0.00829	0.00829	g
Peak Displacement	0.00078	0.00502	0.00171	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.139 mm/s at 0.509 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.6 Volts  
 File Name V052I61H.510

#### USBM RI8507 And OSMRE





### Event Report

Date/Time Manual at 12:36:28 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

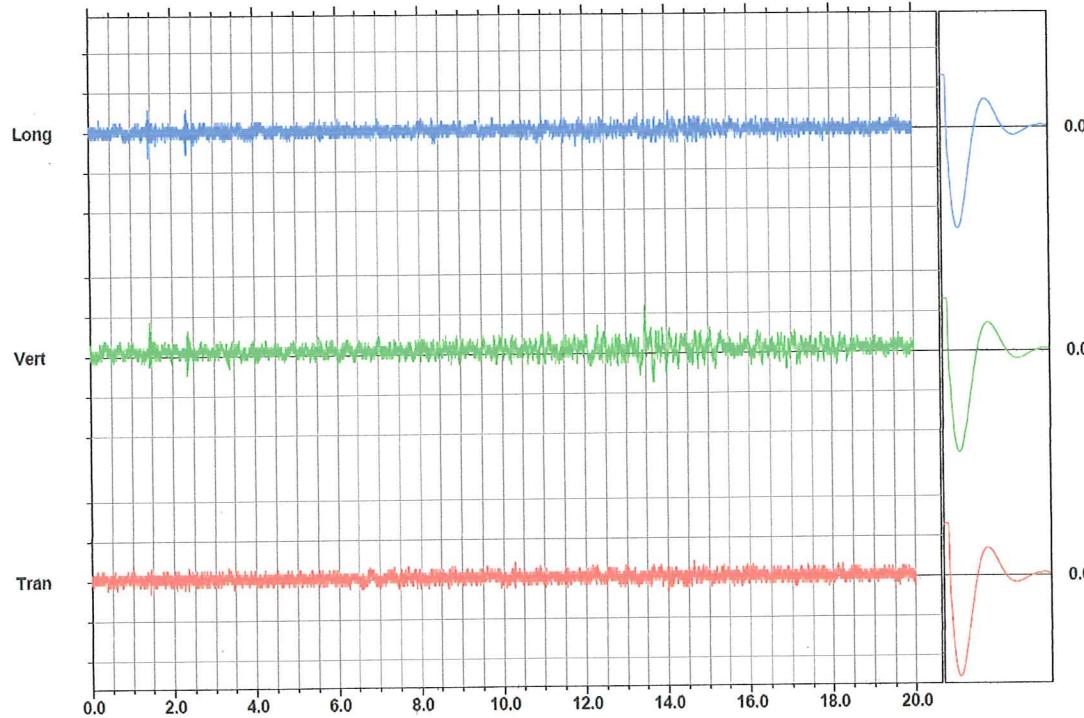
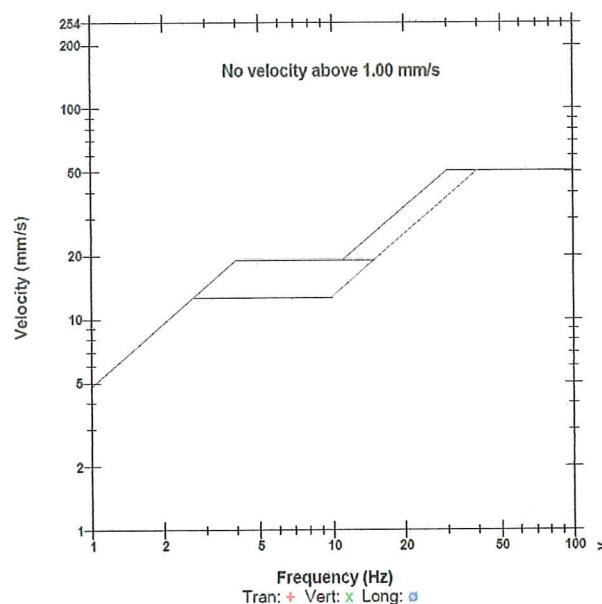
Notes  
 Location: SITIO 22 LO TI METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO22

#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.238	0.127	mm/s
PPV	29.0	38.5	33.1	dB
ZC Freq	64	6.6	85	Hz
Time (Rel. to Trig)	10.282	13.477	1.439	sec
Peak Acceleration	0.00829	0.00994	0.0133	g
Peak Displacement	0.00043	0.00453	0.00064	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.8	
Overswing Ratio	3.8	3.6	3.6	Hz
Peak Vector Sum	0.243	mm/s at 13.477 sec		

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579161F.OSO

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 12:50:50 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps

Job Number: 1

Notes

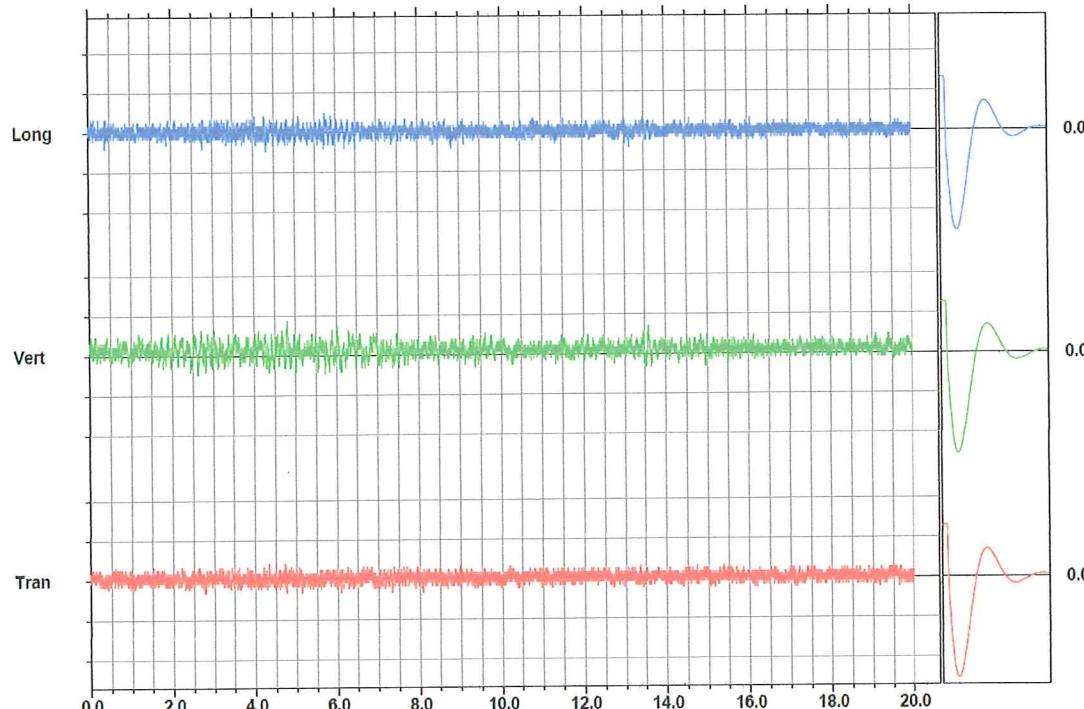
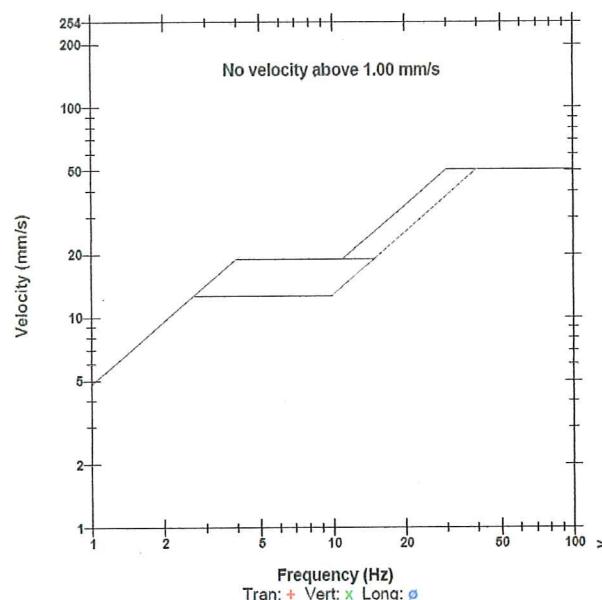
Location: SIMIO 22 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO22

Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.175	0.0952	mm/s
PPV	29.0	35.8	30.6	dB
ZC Freq	28	12	15	Hz
Time (Rel. to Trig)	4.327	4.808	4.309	sec
Peak Acceleration	0.00663	0.00663	0.00663	g
Peak Displacement	0.00039	0.00413	0.00115	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.5	7.7	Hz
Overswing Ratio	3.8	3.7	3.6	
Peak Vector Sum	0.186 mm/s at 4.808 sec			

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I61F.QQ0

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 12:34:24 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 8

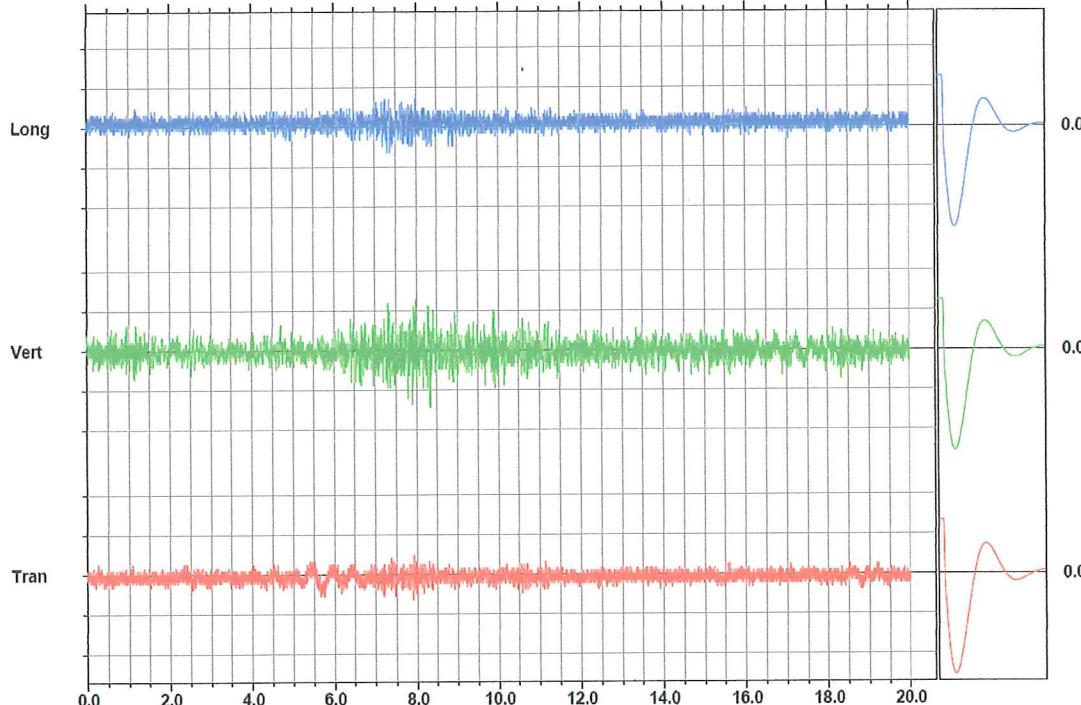
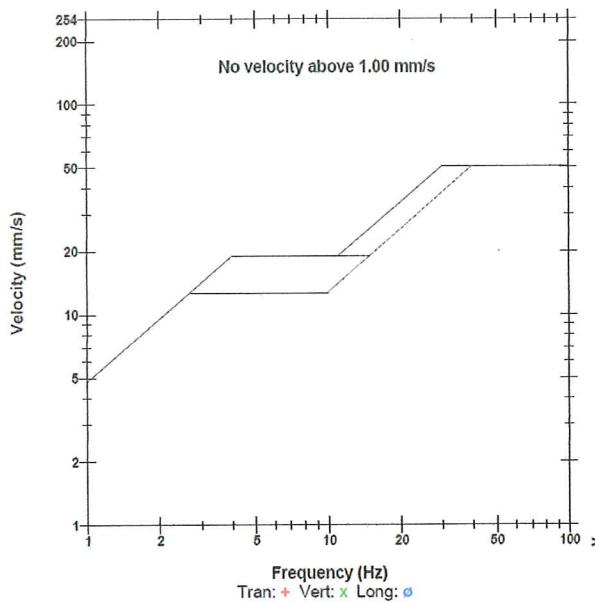
Notes  
 Location: SITIO 22 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

#### Extended Notes

	Tran	Vert	Long	
PPV	0.127	0.286	0.143	mm/s
PPV	33.1	40.1	34.1	dB
ZC Freq	23	23	22	Hz
Time (Rel. to Trig)	7.901	8.326	7.254	sec
Peak Acceleration	0.00829	0.00829	0.00829	g
Peak Displacement	0.00450	0.00249	0.00146	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.5	3.7	3.8	
Peak Vector Sum	0.299 mm/s at 7.901 sec			

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.6 Volts  
 File Name V052I61E.XCO

#### USBM RI8507 And OSMRE



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check



**Instantel**

### Event Report

Date/Time Manual at 12:50:38 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 8

Notes  
 Location: SITIO 22 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

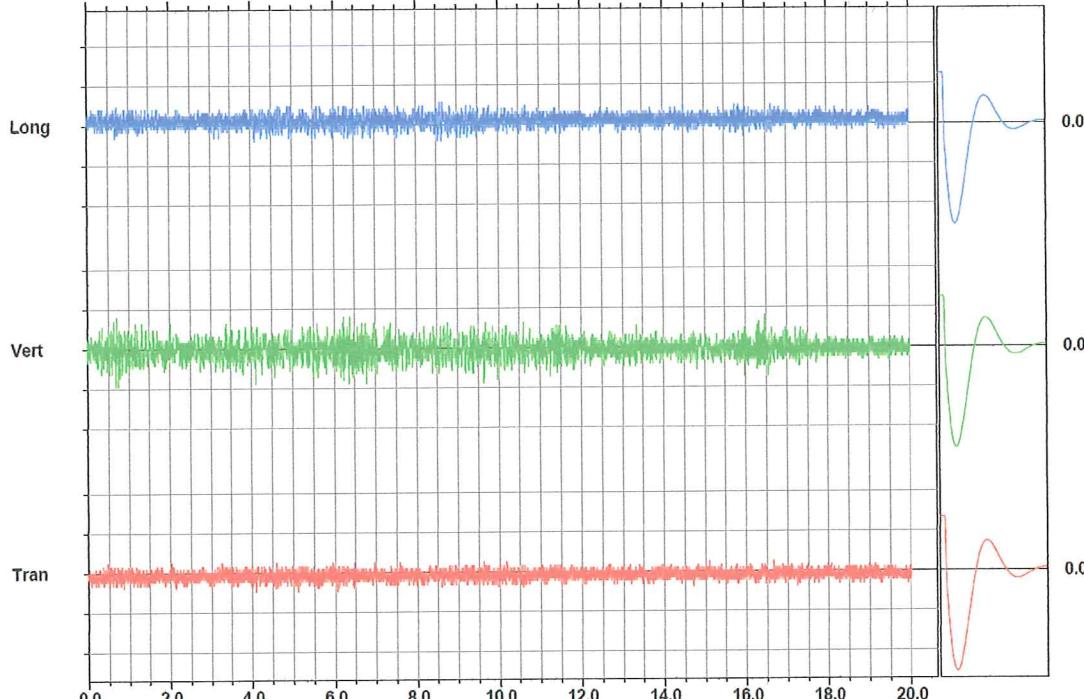
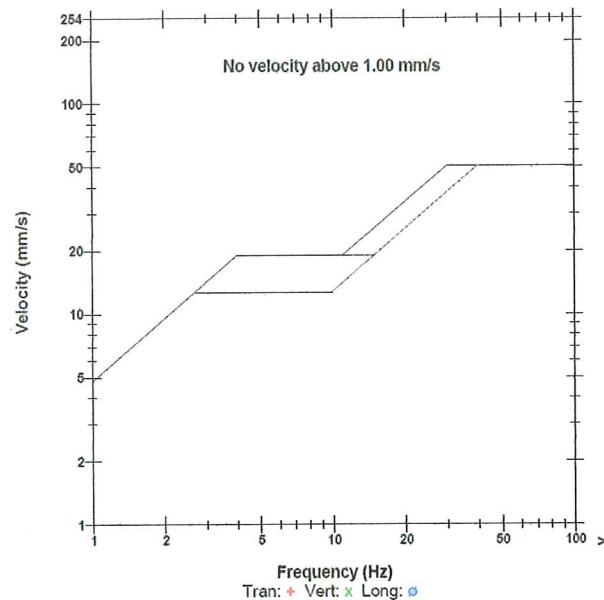
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.190	0.111	mm/s
PPV	30.6	36.6	31.9	dB
ZC Freq	22	26	15	Hz
Time (Rel. to Trig)	4.089	0.686	8.581	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00067	0.00146	0.00122	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.3	7.4	7.5	
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.199 mm/s at 0.686 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.6 Volts  
 File Name V052I61F.OE0

#### USBM RI8507 And OSMRE



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check



### Event Report

Date/Time Manual at 12:06:33 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

**Notes**  
 Location: SITIO 23 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO23

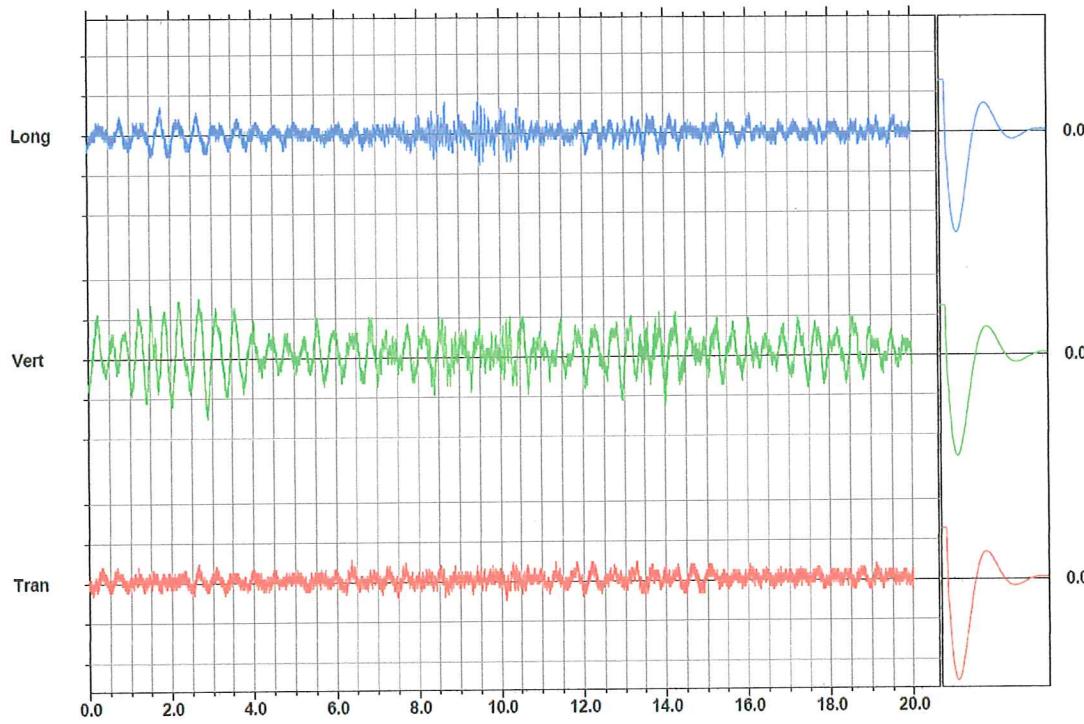
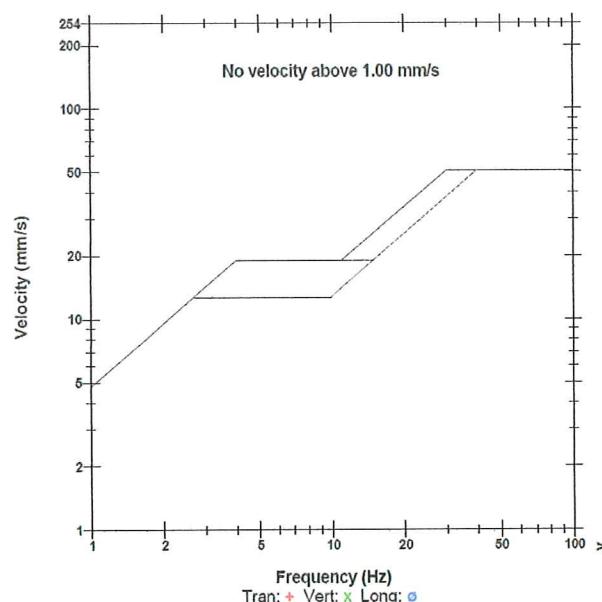
#### Extended Notes

	Tran	Vert	Long	
PPV	0.111	0.302	0.159	mm/s
PPV	31.9	40.6	35.0	dB
ZC Freq	7.0	2.3	13	Hz
Time (Rel. to Trig)	6.355	2.685	8.685	sec
Peak Acceleration	0.00663	0.00829	0.00829	g
Peak Displacement	0.00241	0.01986	0.00577	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.5	7.7	Hz
Overswing Ratio	3.8	3.7	3.6	

Peak Vector Sum 0.314 mm/s at 2.893 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I61D.MX0

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 12:20:59 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 23 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO23

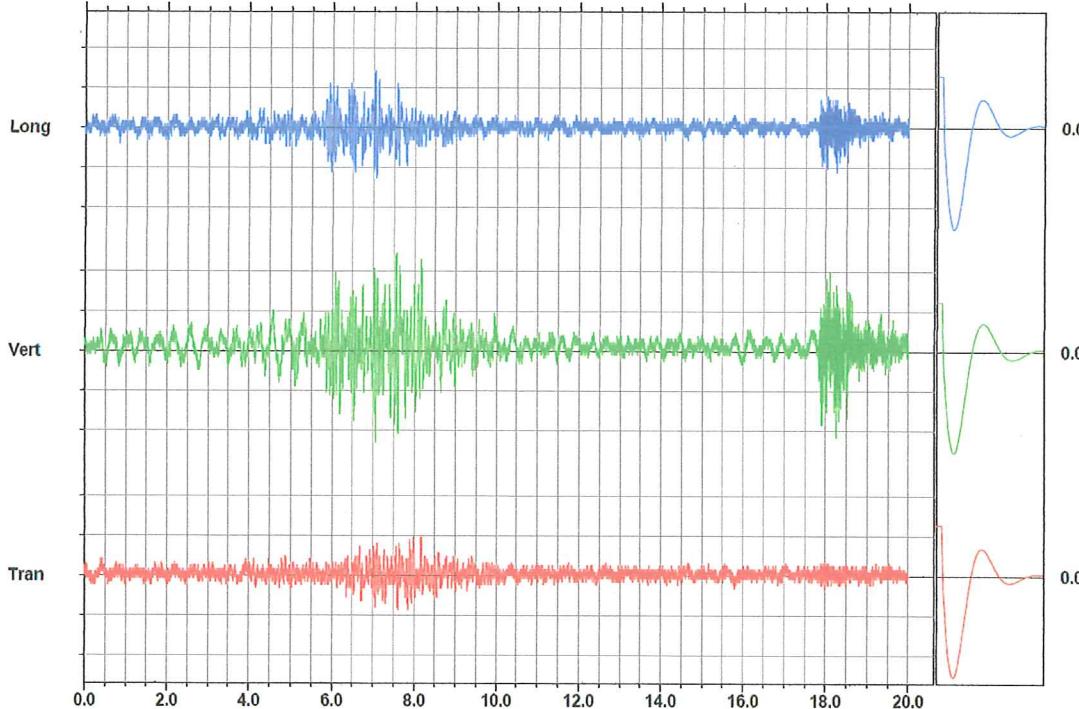
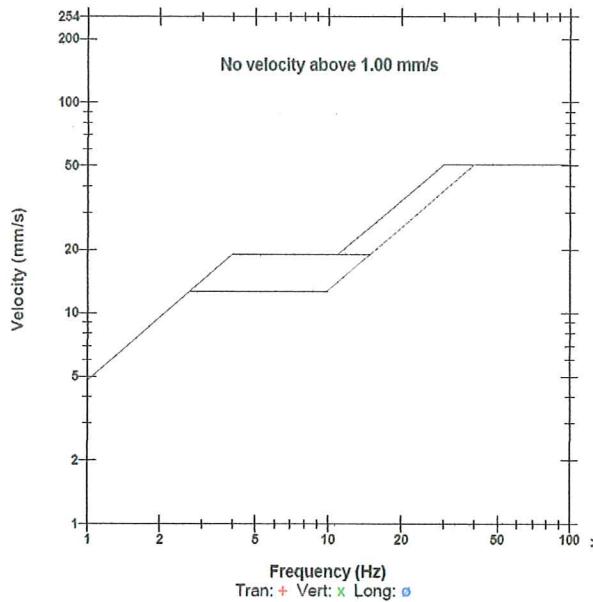
#### Extended Notes

	Tran	Vert	Long	
PPV	0.190	0.492	0.286	mm/s
PPV	36.6	44.8	40.1	dB
ZC Freq	12	15	16	Hz
Time (Rel. to Trig)	7.987	7.565	7.043	sec
Peak Acceleration	0.00663	0.0232	0.0166	g
Peak Displacement	0.00233	0.00881	0.00329	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.5	7.7	Hz
Overswing Ratio	3.8	3.6	3.6	

Peak Vector Sum 0.517 mm/s at 7.566 sec

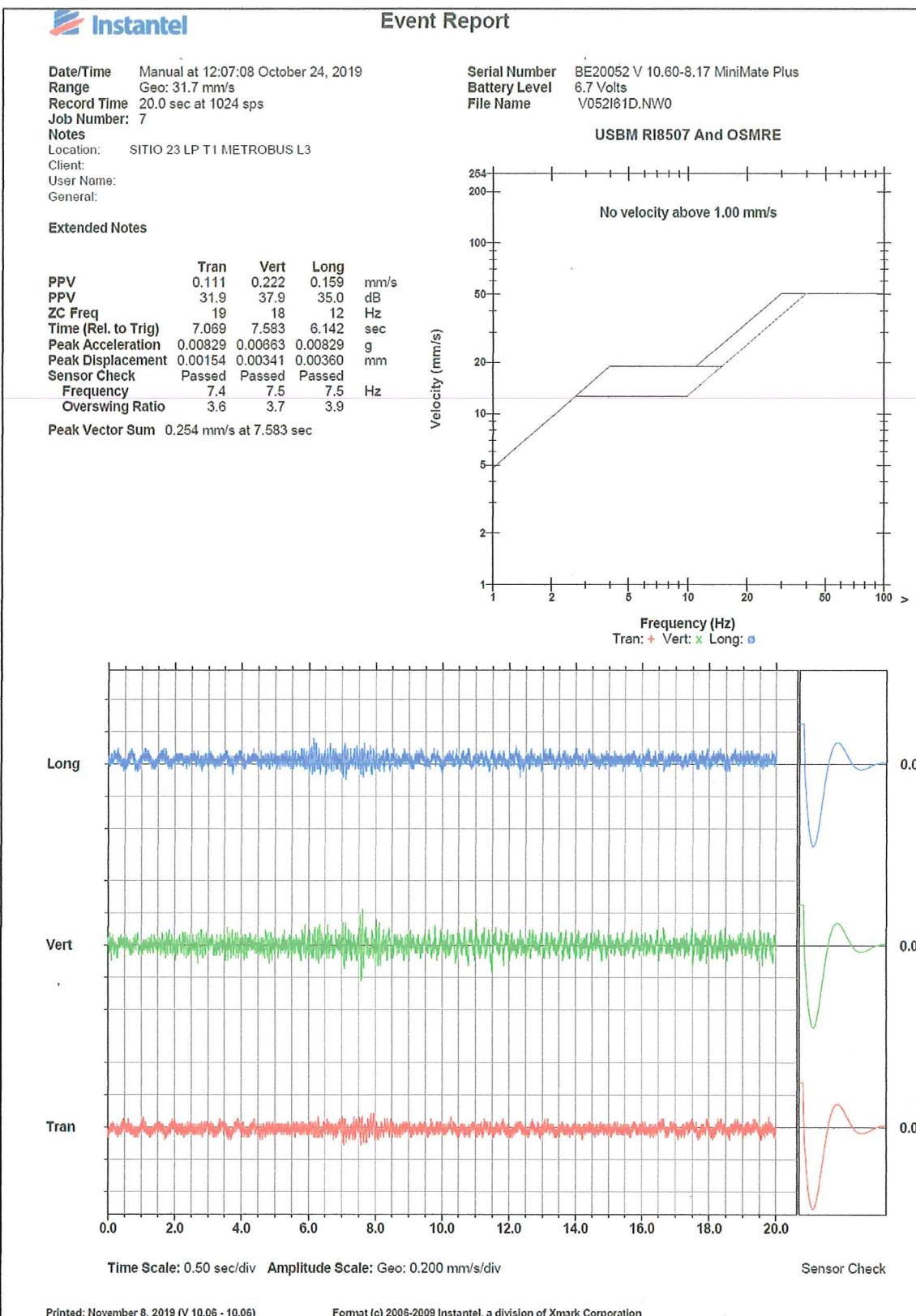
Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I61E.AZ0

#### USBM RI8507 And OSMRE



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check



## Instantel

### Event Report

Date/Time Manual at 12:21:32 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 7

**Notes**  
 Location: SITIO 23 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

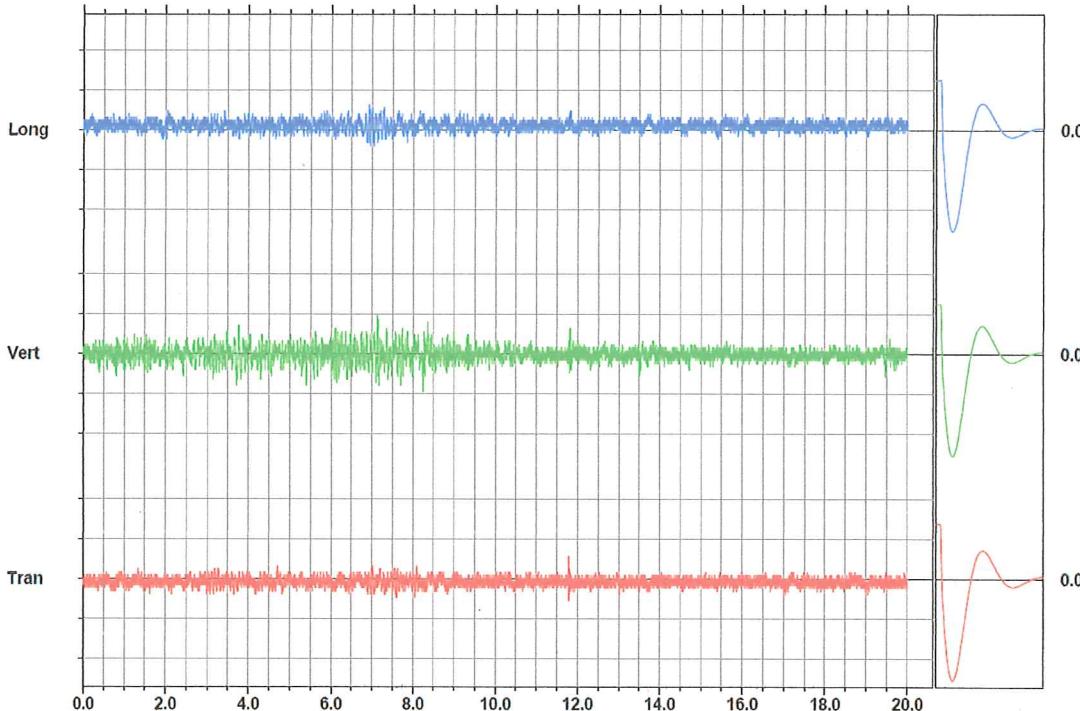
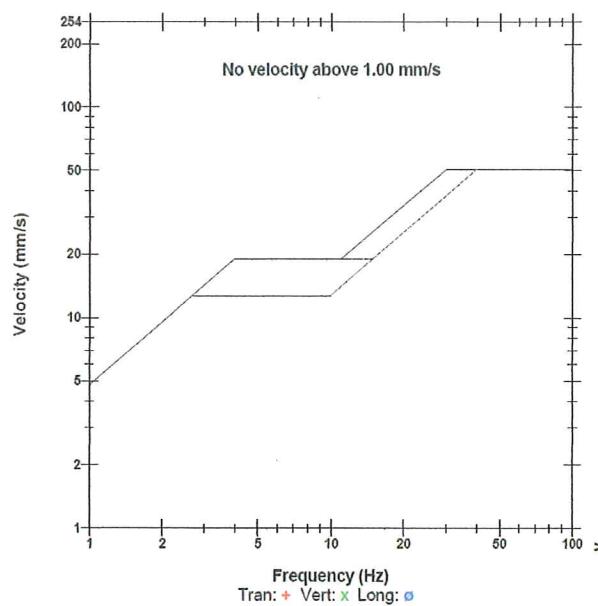
#### Extended Notes

	Tran	Vert	Long	
PPV	0.111	0.190	0.127	mm/s
PPV	31.9	36.6	33.1	dB
ZC Freq	>100	16	14	Hz
Time (Rel. to Trig)	11.789	7.139	6.923	sec
Peak Acceleration	0.0116	0.0149	0.00663	g
Peak Displacement	0.00131	0.00226	0.00171	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.6	3.6	3.8	

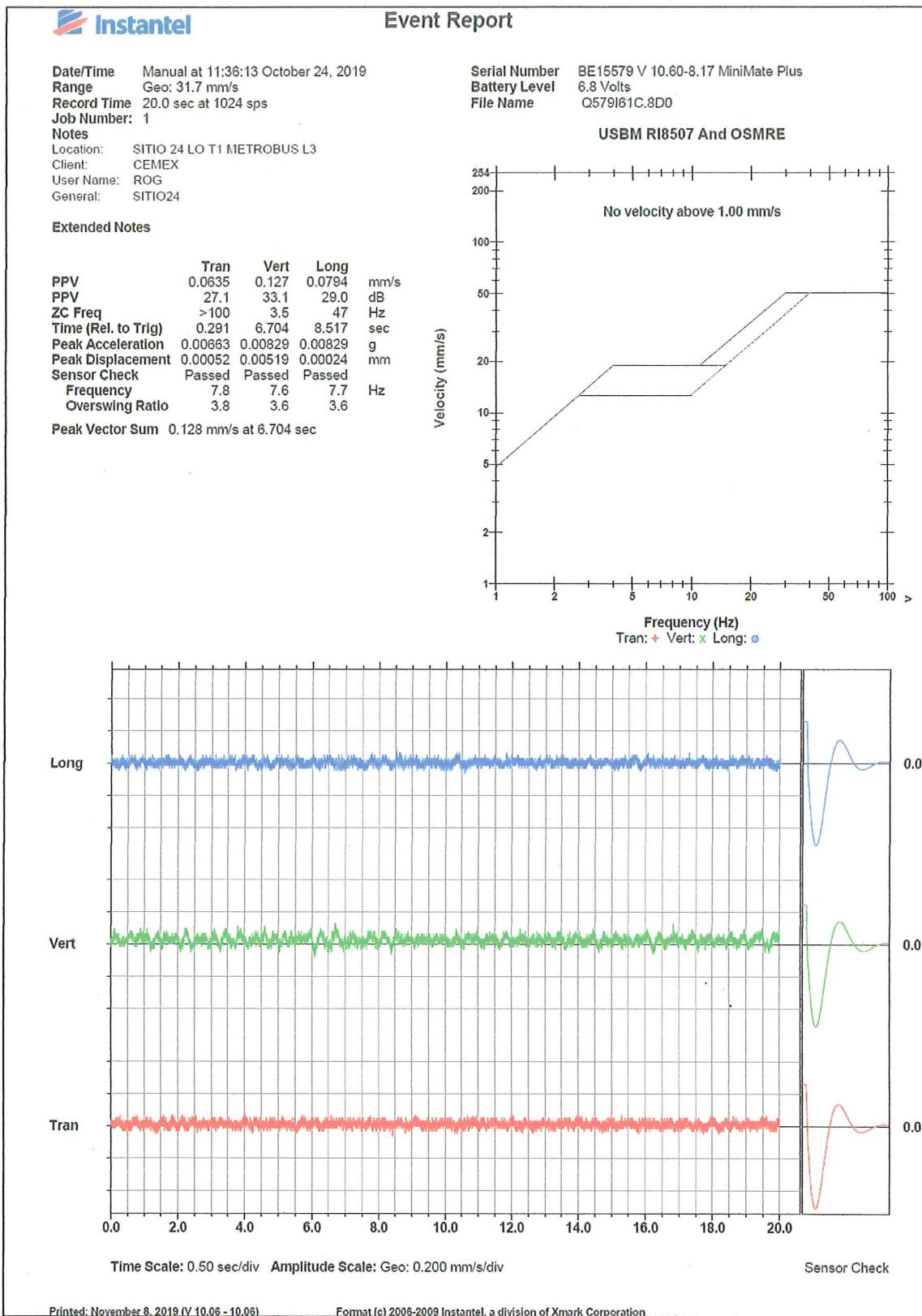
Peak Vector Sum 0.193 mm/s at 8.257 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.6 Volts  
 File Name V052I61E.BW0

#### USBM RI8507 And OSMRE



Sensor Check





## Event Report

Date/Time Manual at 11:44:16 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 24 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO24

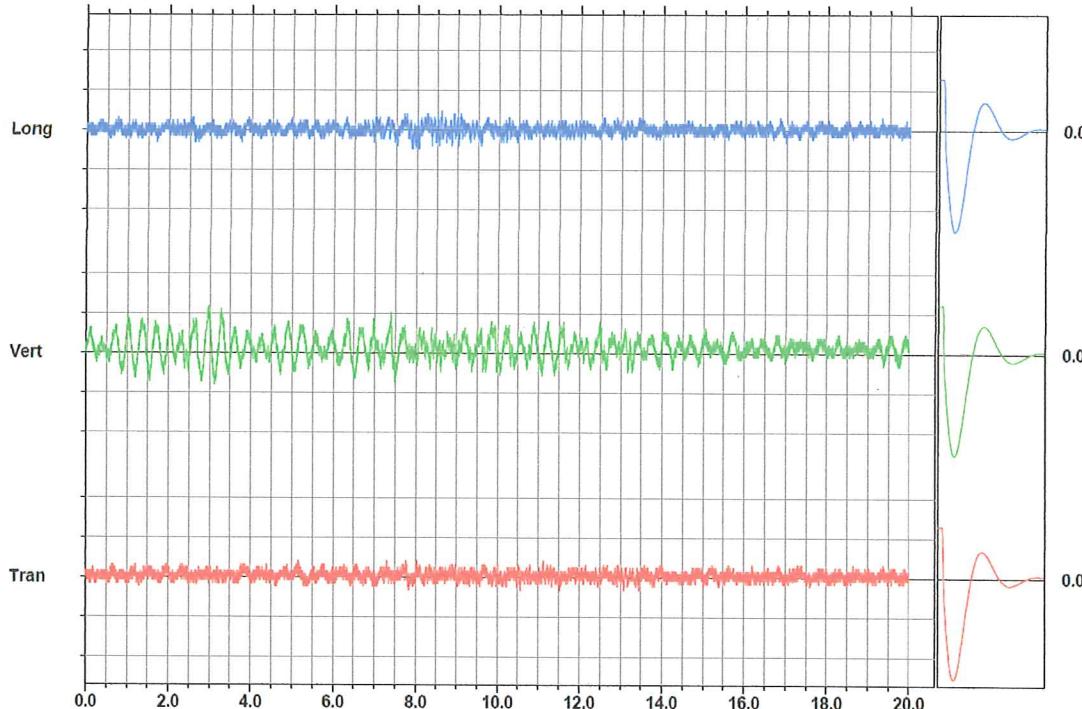
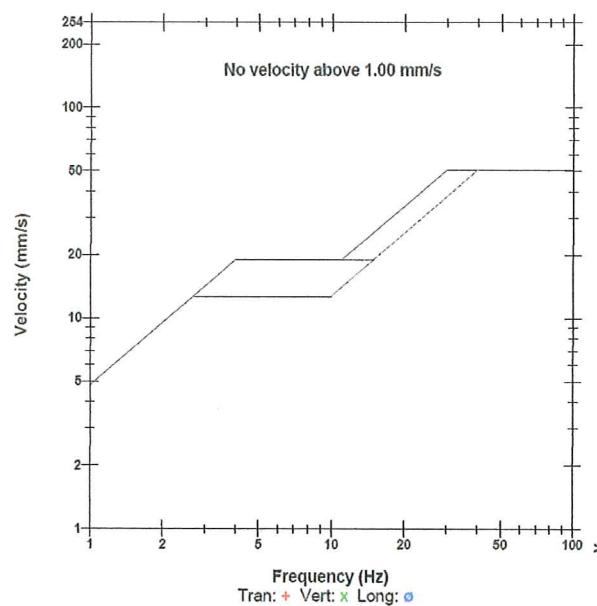
### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.238	0.0952	mm/s
PPV	29.0	38.5	30.6	dB
ZC Freq	57	3.0	11	Hz
Time (Rel. to Trig)	5.166	2.956	7.871	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00078	0.0111	0.00138	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.7	Hz
Overswing Ratio	3.8	3.6	3.6	

Peak Vector Sum 0.243 mm/s at 2.956 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I61C.LS0

### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 11:37:09 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 6

Notes  
 Location: SITIO 24 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

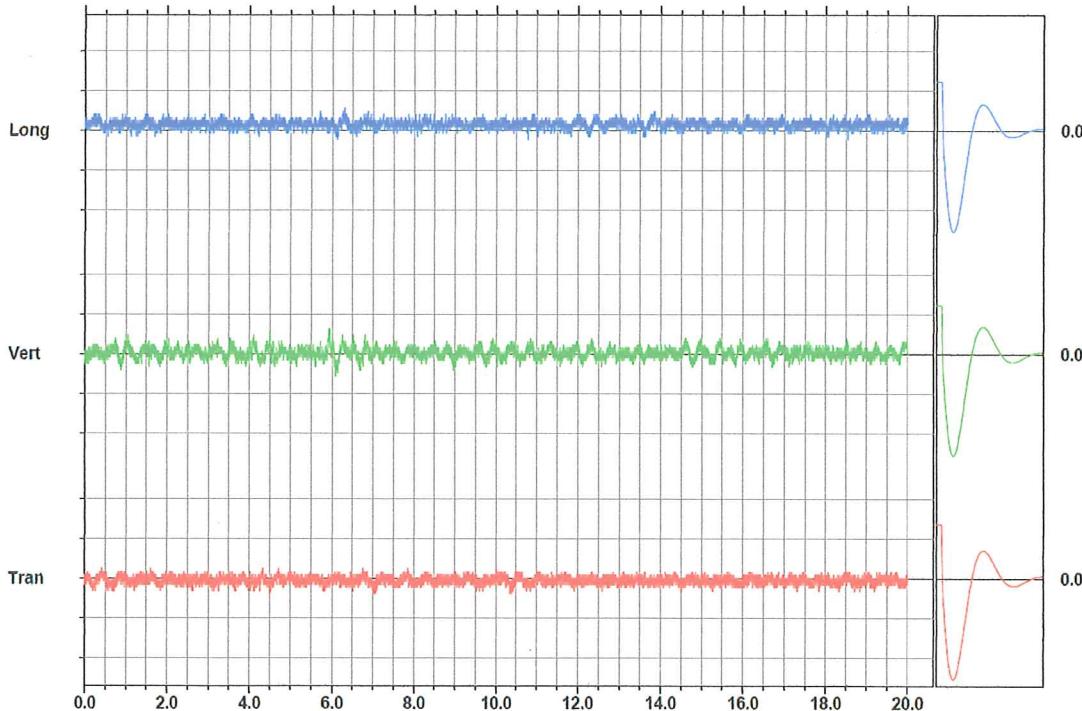
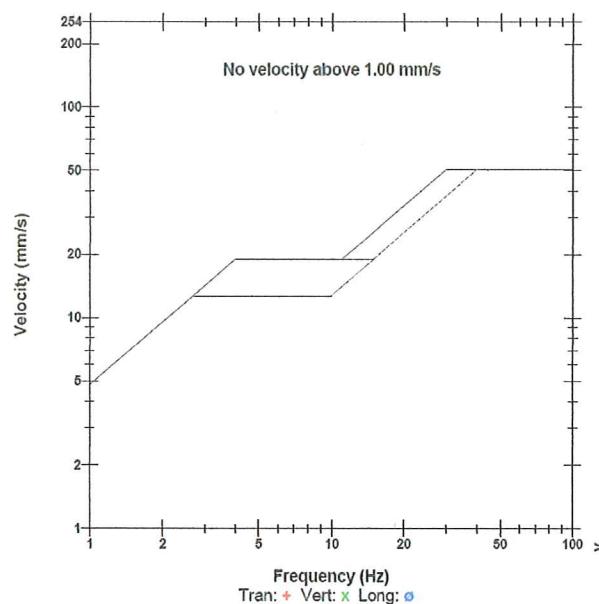
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.127	0.111	mm/s
PPV	29.0	33.1	31.9	dB
ZC Freq	39	7.5	3.6	Hz
Time (Rel. to Trig)	4.510	5.930	6.285	sec
Peak Acceleration	0.00663	0.00829	0.00829	g
Peak Displacement	0.00067	0.00291	0.00380	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.3	7.4	7.4	
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.129 mm/s at 5.933 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I61C.9X0

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 11:45:15 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 6

Notes  
 Location: SITIO 24 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

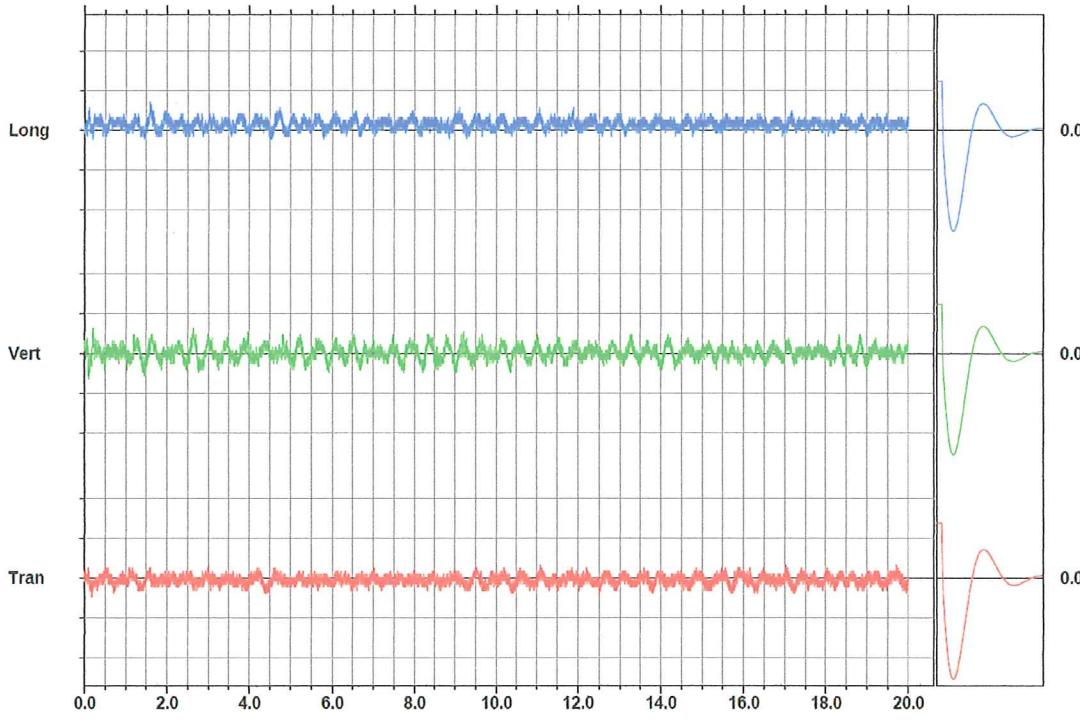
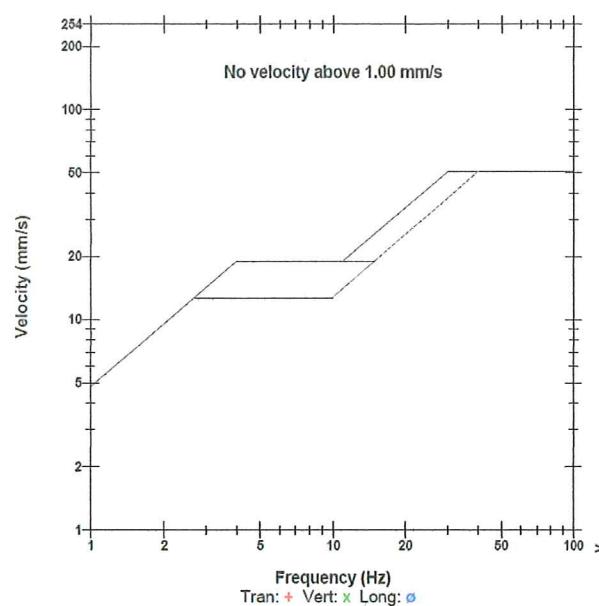
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.127	0.143	mm/s
PPV	30.6	33.1	34.1	dB
ZC Freq	17	9.5	4.1	Hz
Time (Rel. to Trig)	0.182	0.104	1.592	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00267	0.00393	0.00653	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.159 mm/s at 0.108 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I61C.NFO

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 11:08:34 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 25 LO TI METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO25

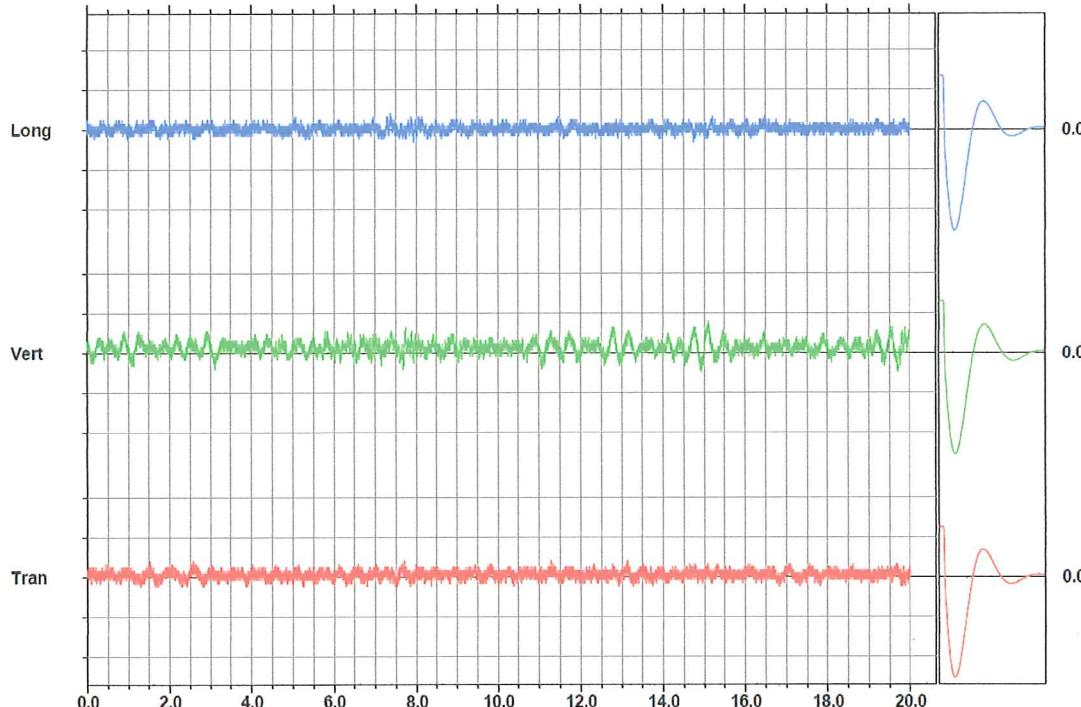
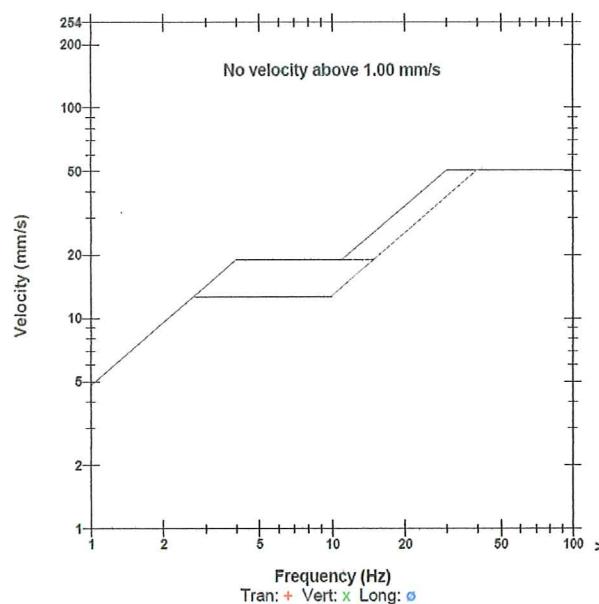
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.159	0.0794	mm/s
PPV	29.0	35.0	29.0	dB
ZC Freq	27	3.1	20	Hz
Time (Rel. to Trig)	1.513	15.106	7.378	sec
Peak Acceleration	0.00663	0.00663	0.00663	g
Peak Displacement	0.00084	0.00760	0.00061	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.8	7.6	7.7	
Overswing Ratio	3.8	3.6	3.7	

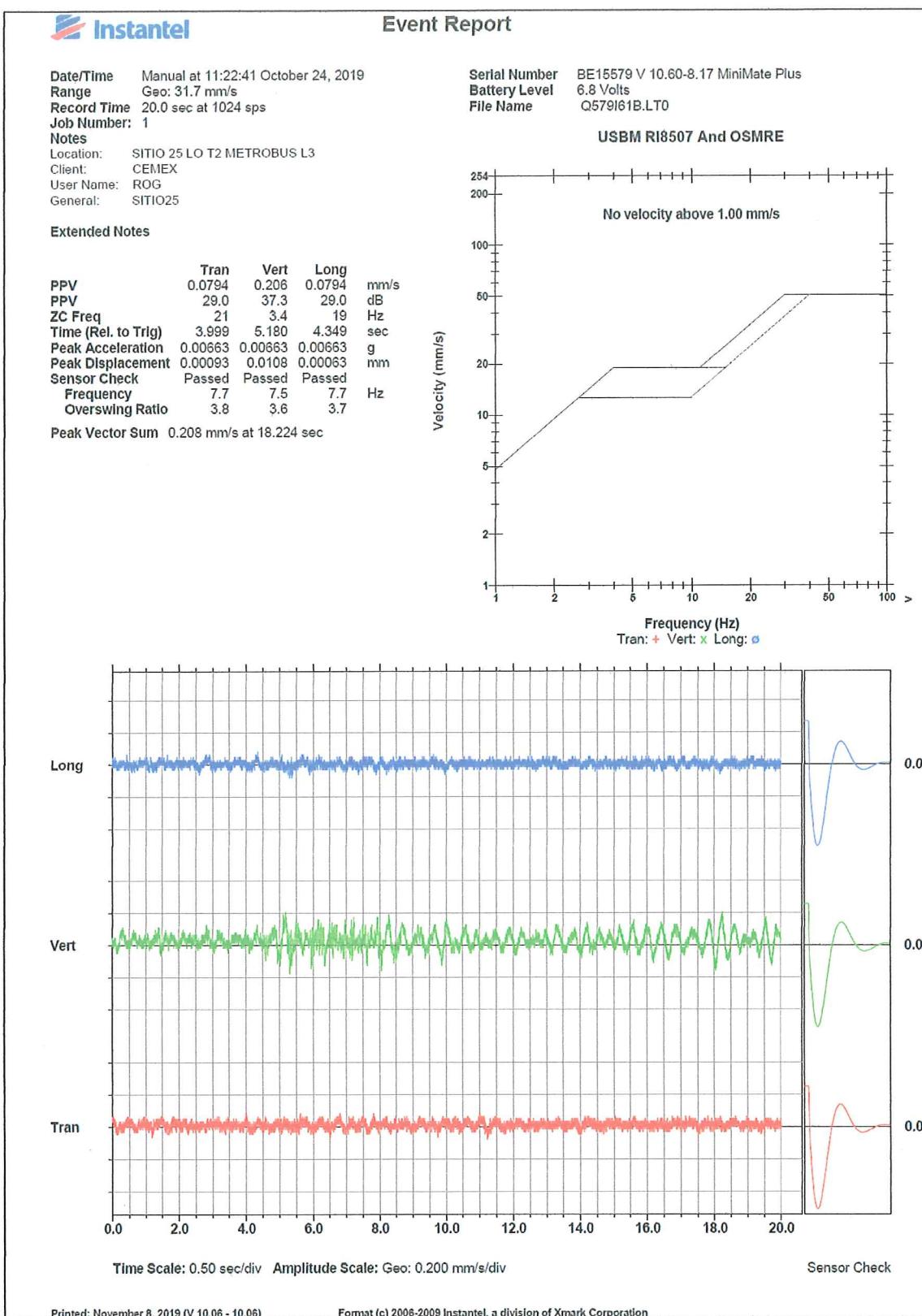
Peak Vector Sum 0.166 mm/s at 15.106 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I61A.YAO

#### USBM RI8507 And OSMRE



Sensor Check





### Event Report

Date/Time Manual at 11:08:12 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 5

Notes  
 Location: SITIO 25 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

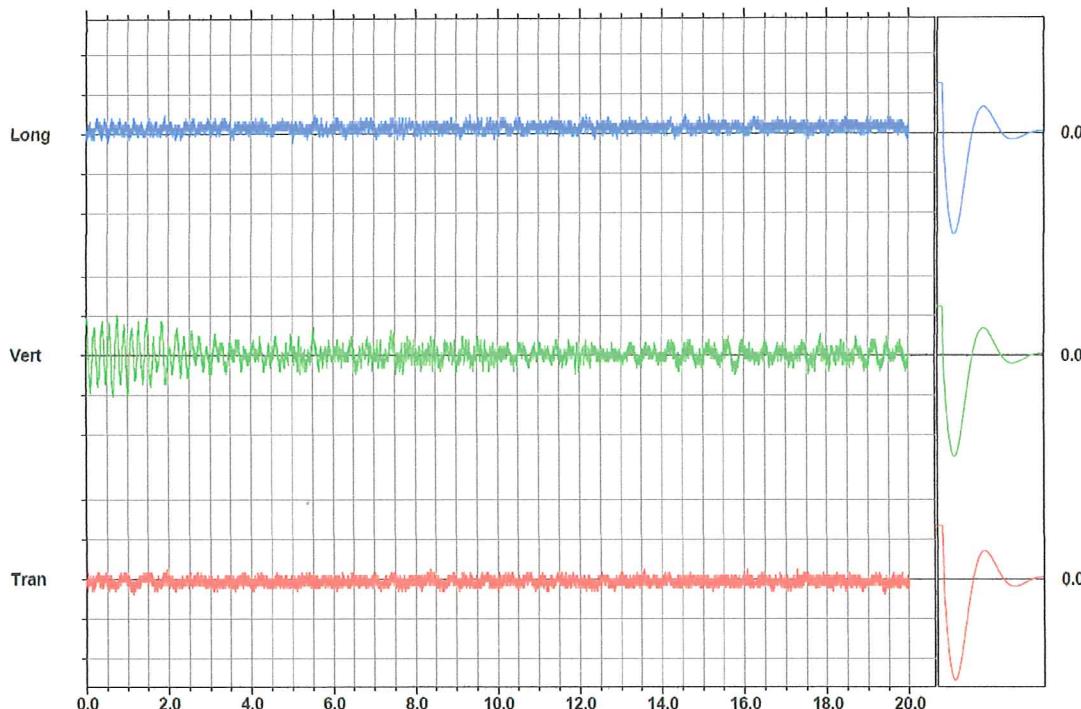
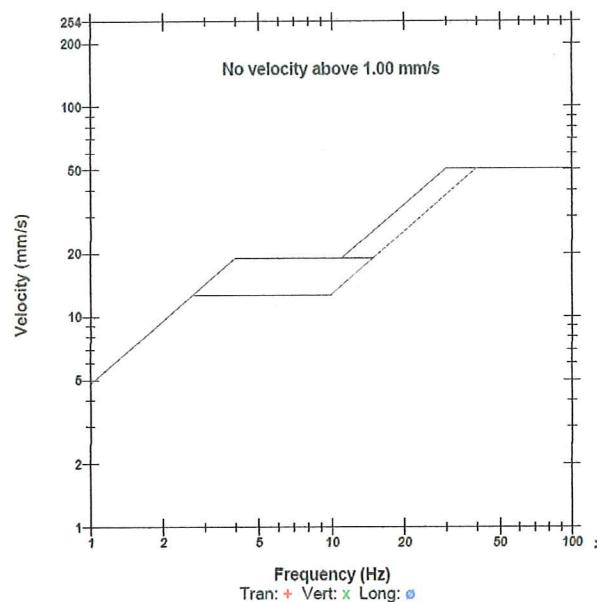
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0694	0.207	0.0950	mm/s
PPV	29.0	37.3	30.6	dB
ZC Freq	32	5.4	9.8	Hz
Time (Rel. to Trig)	1.130	0.648	1.901	sec
Peak Acceleration	0.00929	0.00829	0.00663	g
Peak Displacement	0.00073	0.00630	0.00239	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.3	7.4	7.4	
Overswing Ratio	3.7	3.8	3.9	

Peak Vector Sum 0.214 mm/s at 0.648 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I61B.MY0

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 11:23:22 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 5

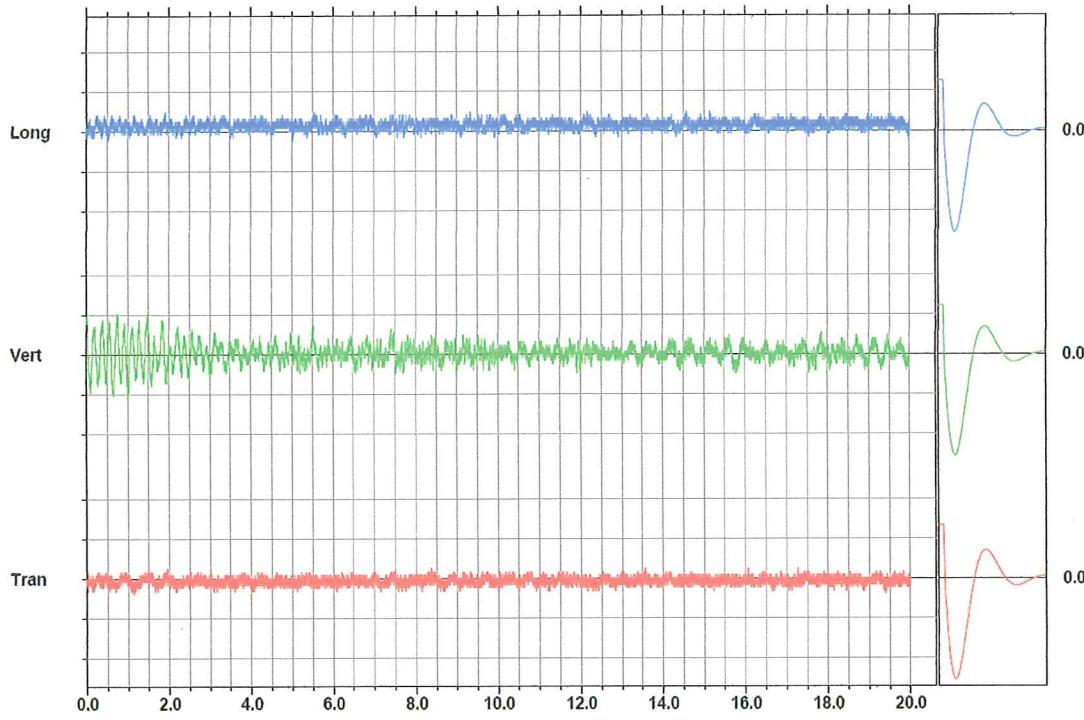
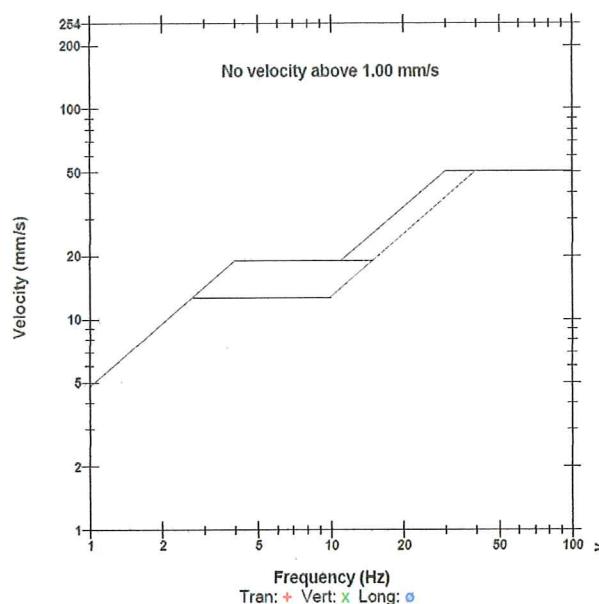
Notes  
 Location: SITIO 25 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.206	0.0952	mm/s
PPV	29.0	37.3	30.6	dB
ZC Freq	32	5.4	9.8	Hz
Time (Rel. to Trig)	1.130	0.648	1.901	sec
Peak Acceleration	0.00829	0.00829	0.00663	g
Peak Displacement	0.00073	0.00630	0.00239	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.3	7.4	7.4	
Overswing Ratio	3.7	3.8	3.9	
Peak Vector Sum	0.214 mm/s at 0.648 sec			

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I61BB.MY0

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 10:34:00 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 26 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO26

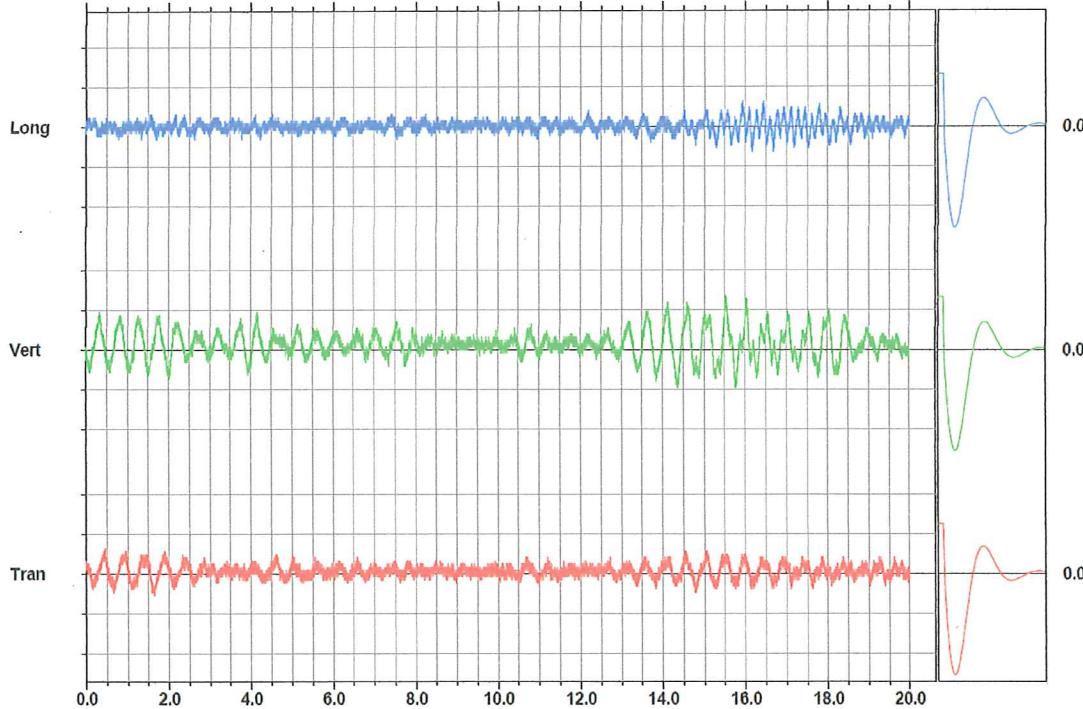
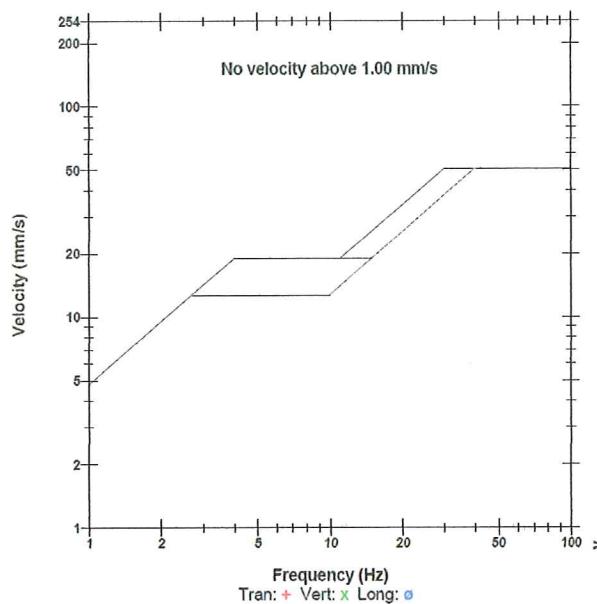
#### Extended Notes

	Tran	Vert	Long	
PPV	0.127	0.270	0.127	mm/s
PPV	33.1	39.6	33.1	dB
ZC Freq	3.5	2.8	5.3	Hz
Time (Rel. to Trig)	0.456	15.516	15.927	sec
Peak Acceleration	0.00829	0.00663	0.00663	g
Peak Displacement	0.00676	0.0168	0.00329	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.8	Hz
Overswing Ratio	3.8	3.7	3.6	

Peak Vector Sum 0.279 mm/s at 15.519 sec

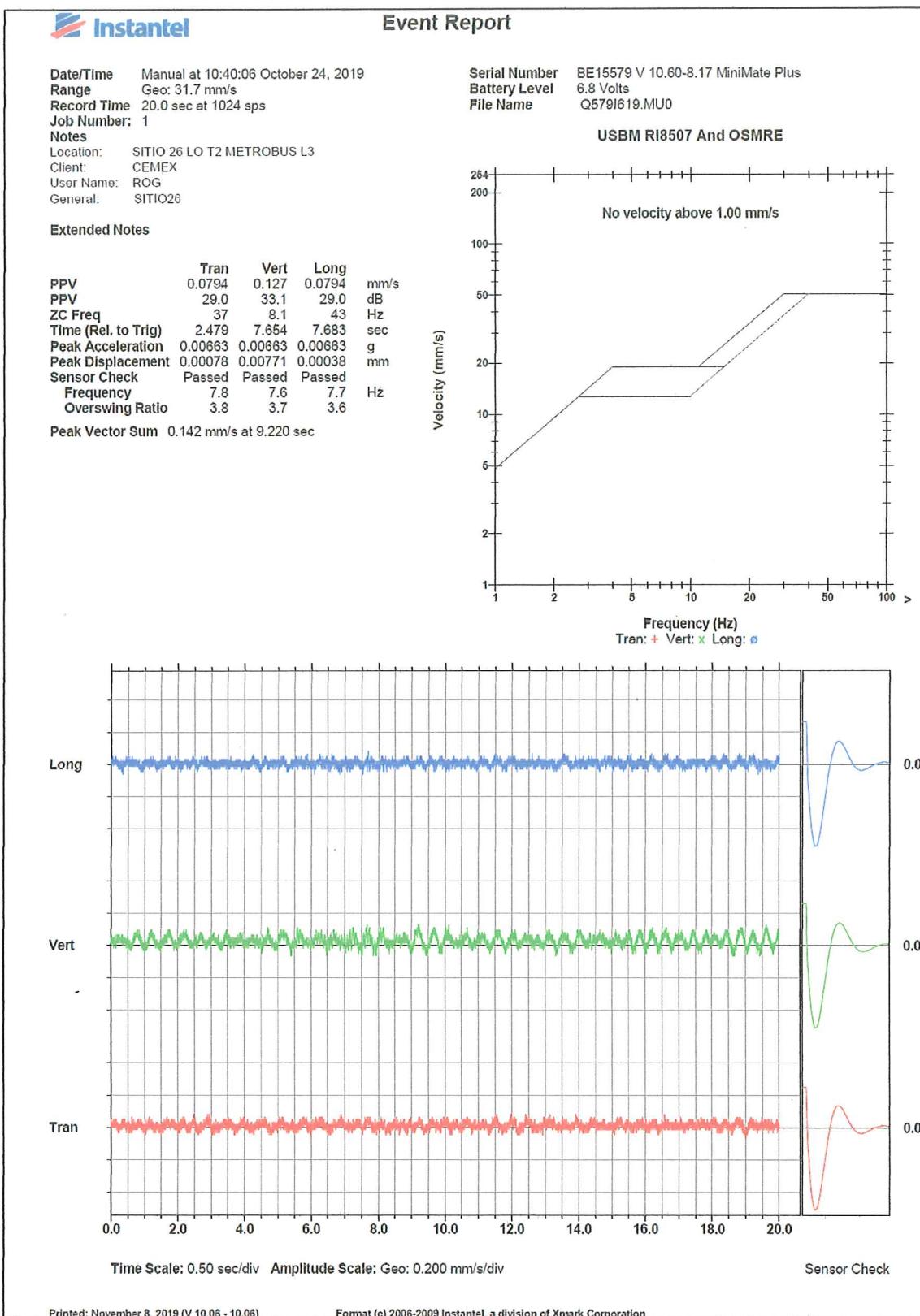
Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I619.COO

#### USBM RI8507 And OSMRE



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check





**Instantel**

**Event Report**

Date/Time Manual at 10:35:21 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 4

Notes  
 Location: SITIO 26 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

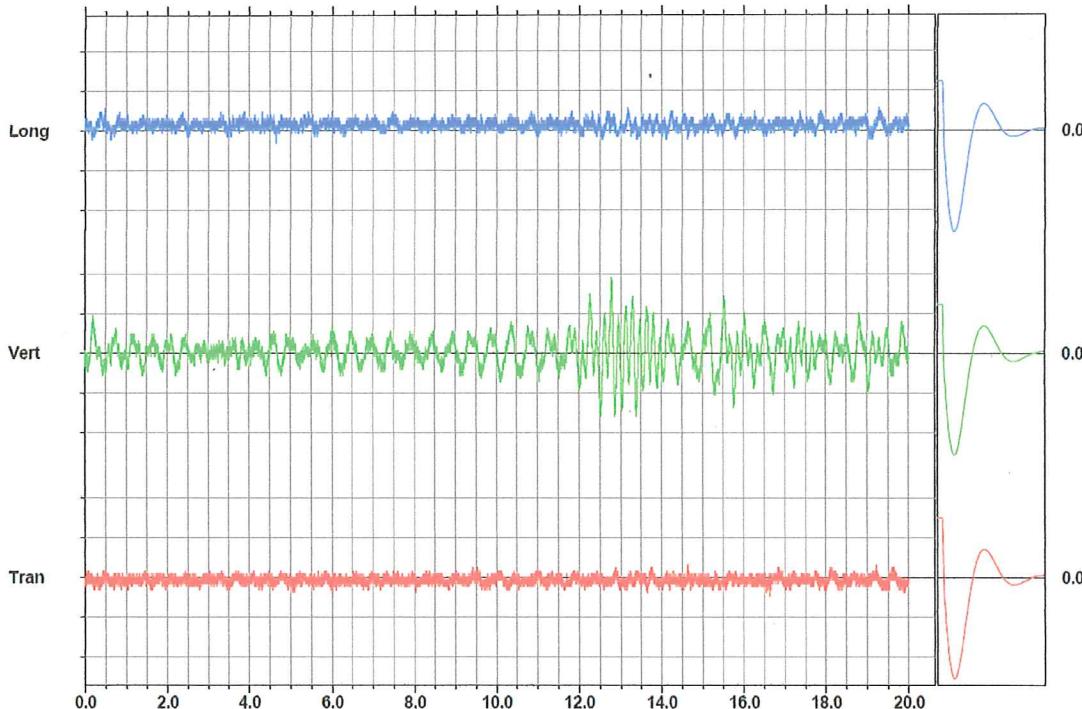
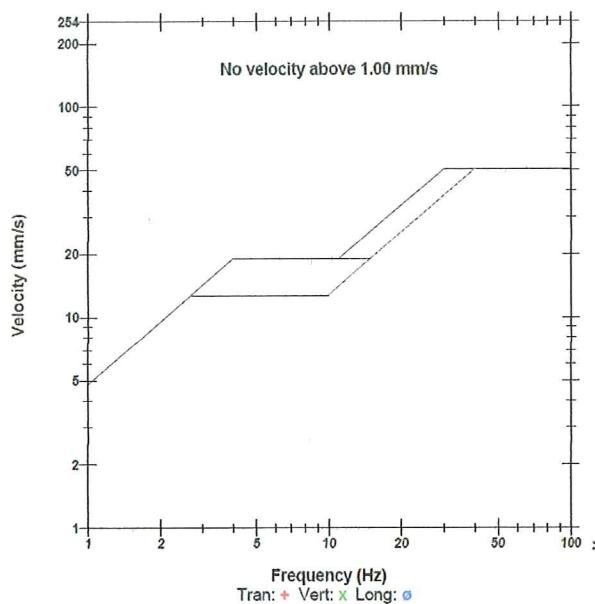
**Extended Notes**

	Tran	Vert	Long	
PPV	0.0952	0.381	0.111	mm/s
PPV	30.6	42.6	31.9	dB
ZC Freq	30	4.8	13	Hz
Time (Rel. to Trig)	16.639	12.779	0.482	sec
Peak Acceleration	0.00829	0.00663	0.00829	g
Peak Displacement	0.00104	0.0121	0.00441	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.4	7.4	7.4	
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.384 mm/s at 12.779 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I619.EX0

**USBM RI8507 And OSMRE**



Sensor Check

**Instantel**
**Event Report**

Date/Time Manual at 10:41:23 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 4

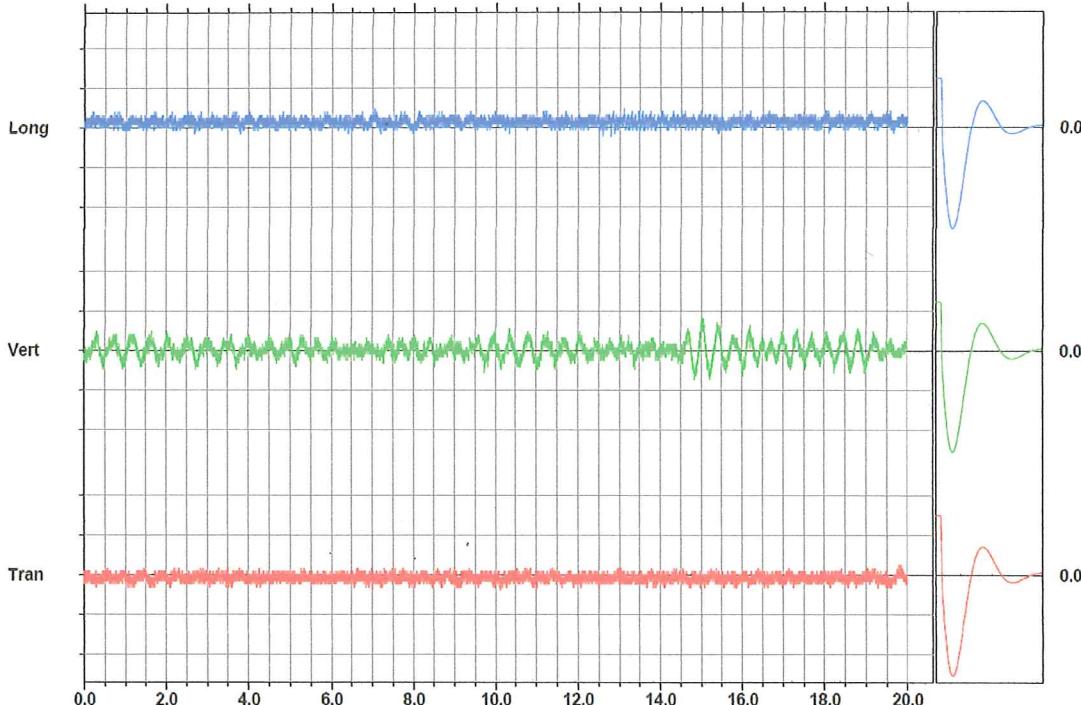
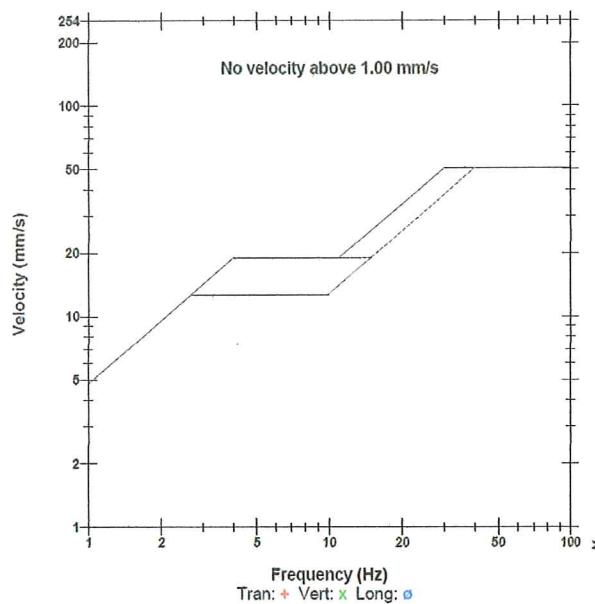
Notes  
 Location: SITIO 26 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

**Extended Notes**

	Tran	Vert	Long	
PPV	0.0794	0.159	0.0952	mm/s
PPV	29.0	35.0	30.6	dB
ZC Freq	>100	3.4	4.0	Hz
Time (Rel. to Trig)	7.011	15.007	7.042	sec
Peak Acceleration	0.00663	0.00829	0.00829	g
Peak Displacement	0.00050	0.00750	0.00310	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.4	7.4	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.169 mm/s at 15.021 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.7 Volts  
 File Name V052I619.OZ0

**USBM RI8507 And OSMRE**


Sensor Check



### Event Report

Date/Time Manual at 10:03:25 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps

Job Number: 1

Notes

Location: MSITIO 27 LO T1 ETROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO27

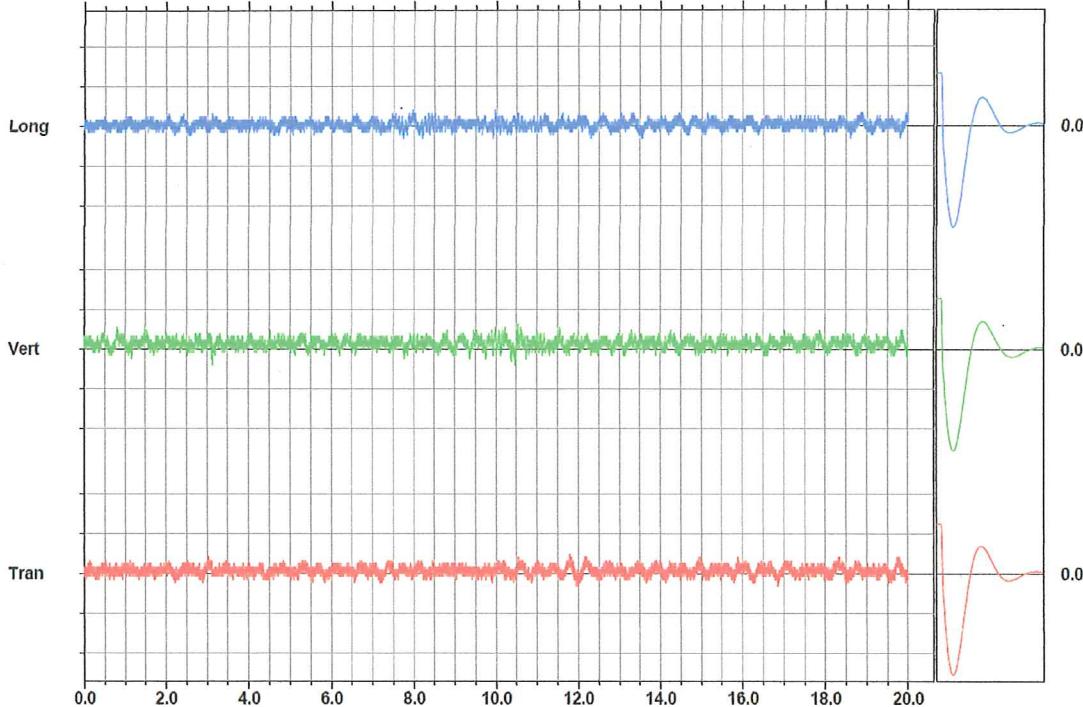
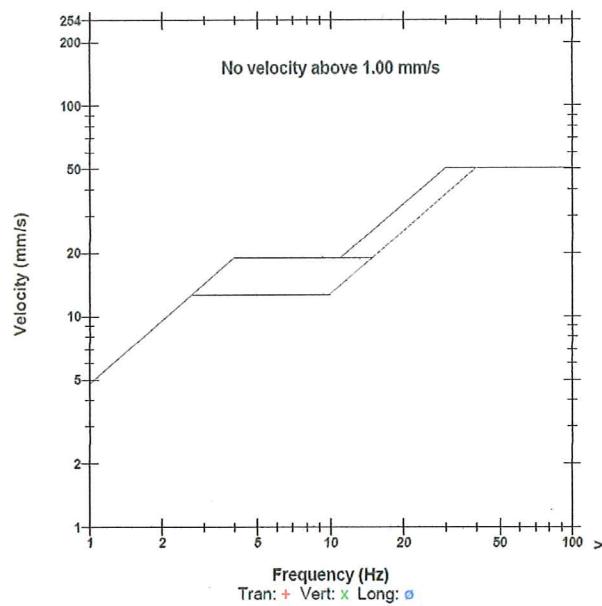
Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.127	0.0794	mm/s
PPV	30.6	33.1	29.0	dB
ZC Freq	7.9	11	11	Hz
Time (Rel. to Trig)	11.778	10.525	7.958	sec
Peak Acceleration	0.00663	0.00663	0.00663	g
Peak Displacement	0.00227	0.00365	0.00110	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.8	7.5	7.7	
Overswing Ratio	3.7	3.7	3.7	

Peak Vector Sum 0.132 mm/s at 10.525 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q5791617.XPO

#### USBM RI8507 And OSMRE



Sensor Check

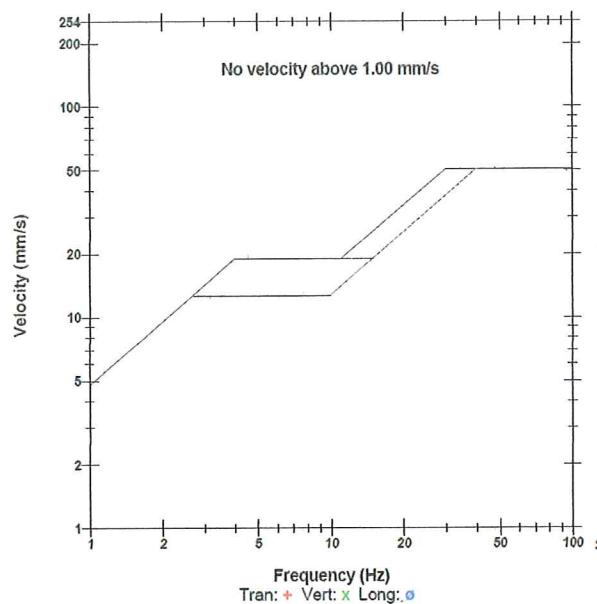


### Event Report

Date/Time Manual at 10:10:44 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1  
 Notes  
 Location: SITIO 27 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO27

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I618.9W0

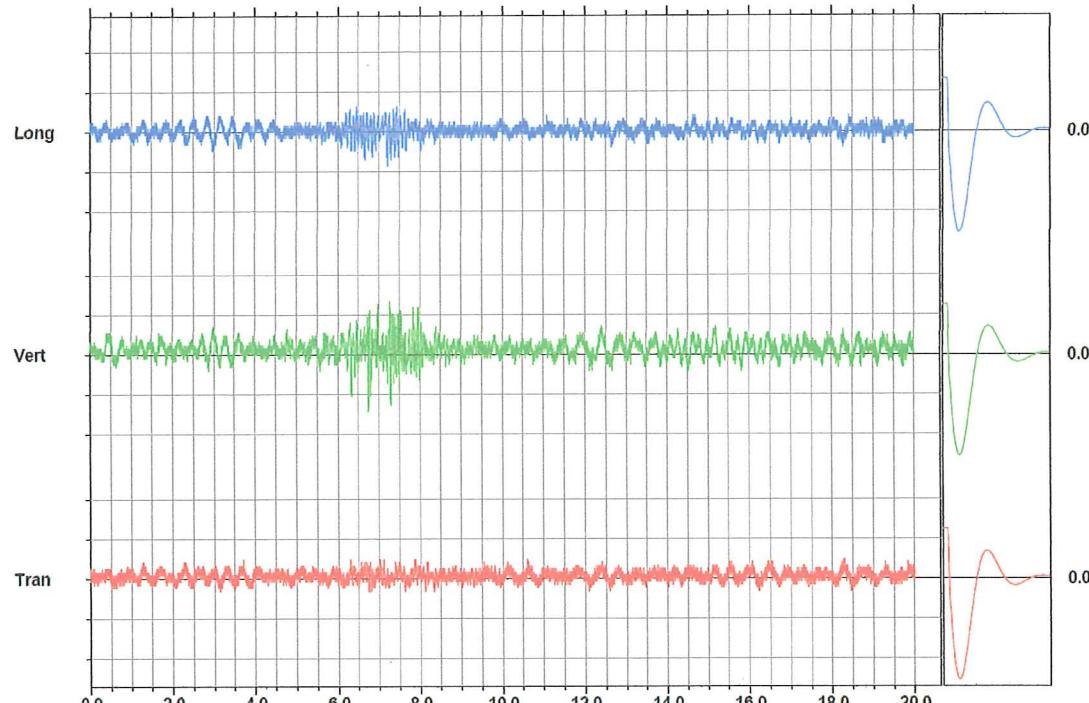
#### USBM RI8507 And OSMRE



#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.286	0.175	mm/s
PPV	30.6	40.1	35.8	dB
ZC Freq	14	19	12	Hz
Time (Rel. to Trig)	3.703	6.747	7.215	sec
Peak Acceleration	0.00829	0.00663	0.00829	g
Peak Displacement	0.00277	0.00750	0.00286	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.7	Hz
Overswing Ratio	3.8	3.7	3.7	

Peak Vector Sum 0.297 mm/s at 6.747 sec



Sensor Check



**Event Report**

Date/Time Manual at 10:03:41 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 3

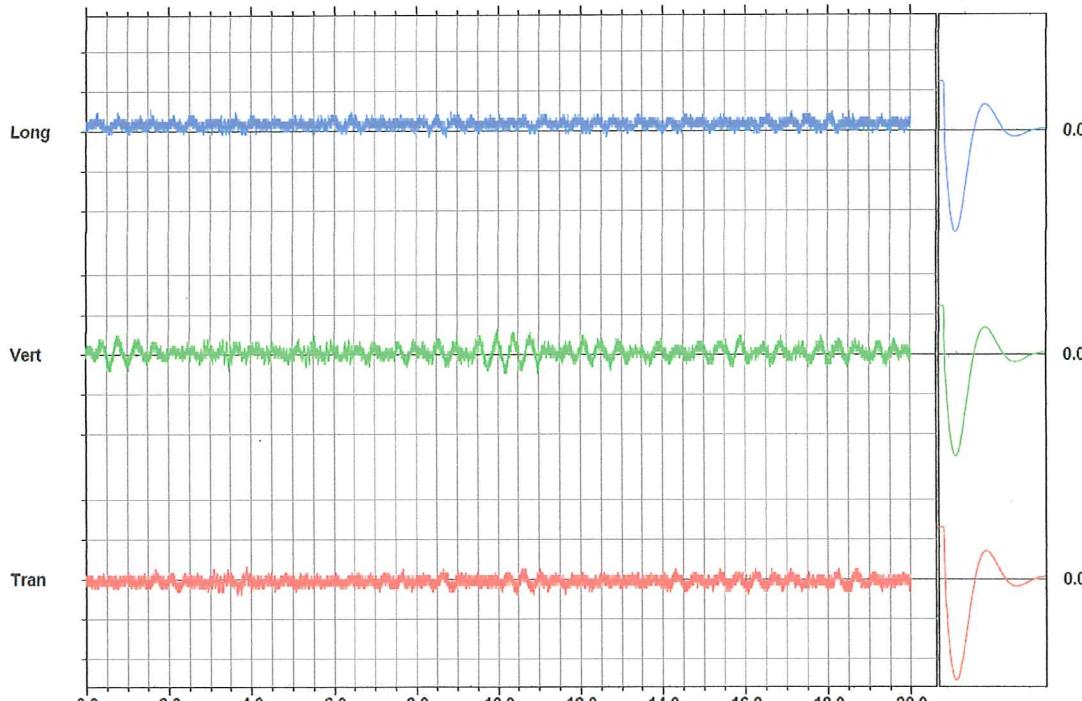
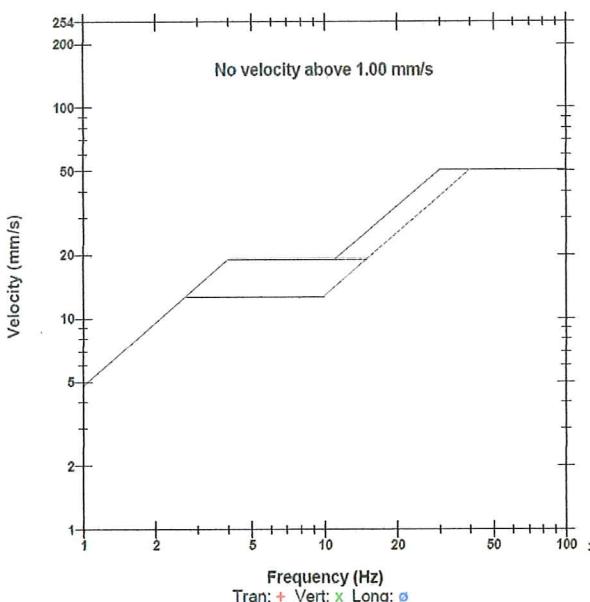
Notes  
 Location: SITIO 27 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

**Extended Notes**

	Tran	Vert	Long	
PPV	0.0794	0.127	0.111	mm/s
PPV	29.0	33.1	31.9	dB
ZC Freq	13	5.2	12	Hz
Time (Rel. to Trig)	3.669	9.984	1.567	sec
Peak Acceleration	0.00663	0.00663	0.00829	g
Peak Displacement	0.00112	0.00521	0.00367	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.7	3.8	4.0	
Peak Vector Sum	0.128 mm/s at 9.984 sec			

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I617.Y50

**USBM RI8507 And OSMRE**



Sensor Check



### Event Report

Date/Time Manual at 10:10:57 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 3

Notes  
 Location: SITIO 27 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

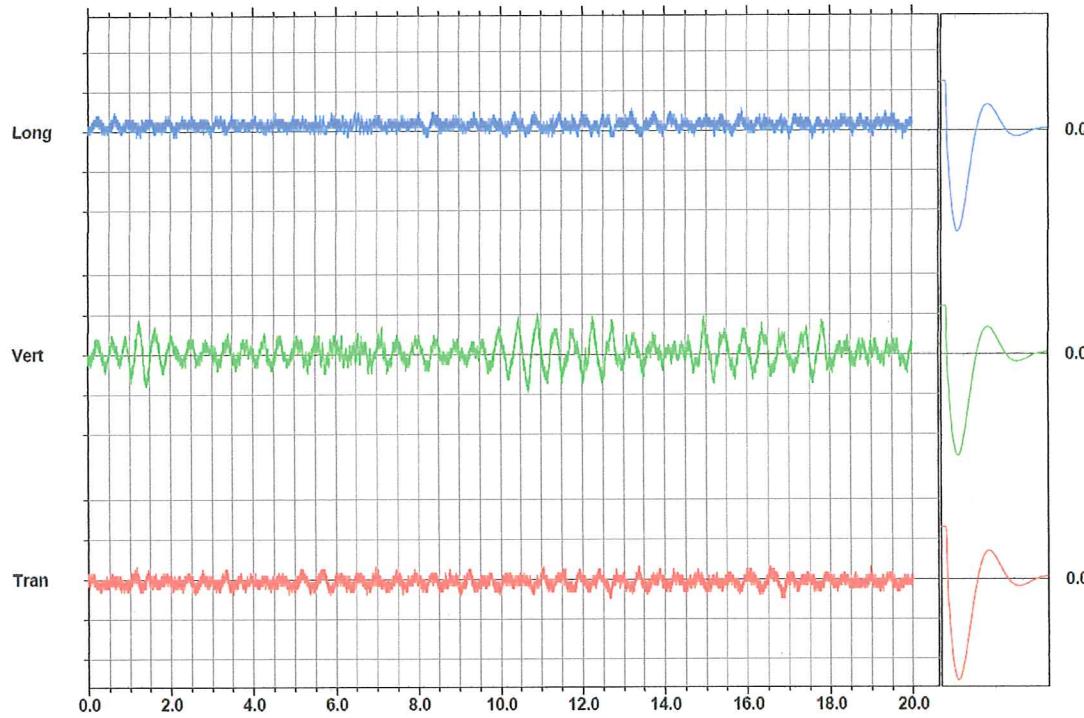
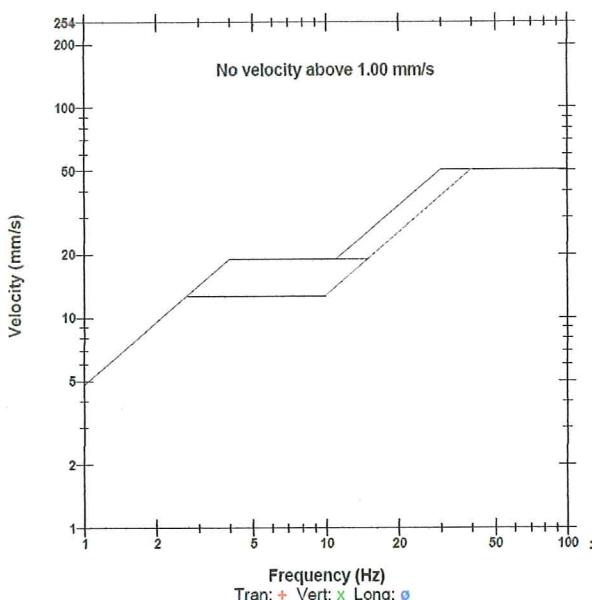
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.206	0.111	mm/s
PPV	30.6	37.3	31.9	dB
ZC Freq	6.6	2.4	3.5	Hz
Time (Rel. to Trig)	12.669	10.911	13.216	sec
Peak Acceleration	0.00829	0.00829	0.00663	g
Peak Displacement	0.00379	0.0118	0.00434	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.214 mm/s at 10.911 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V0521618.A90

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 09:32:14 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps

Job Number: 1

Notes

Location: SITIO 28 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO28

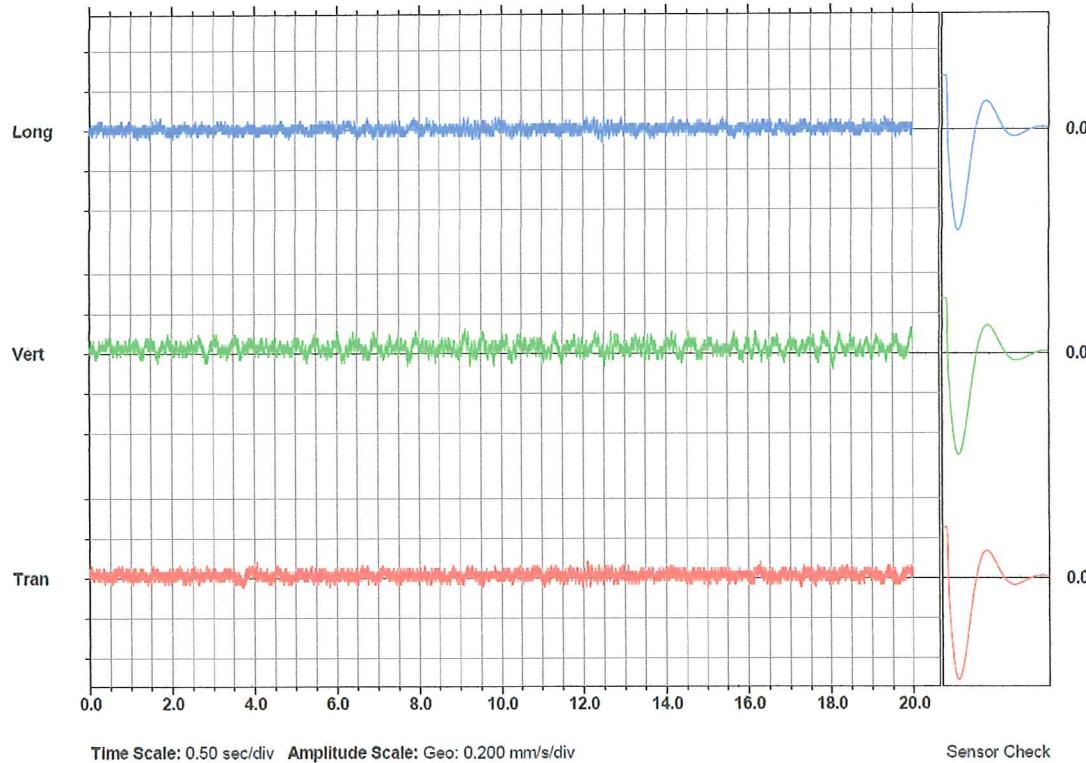
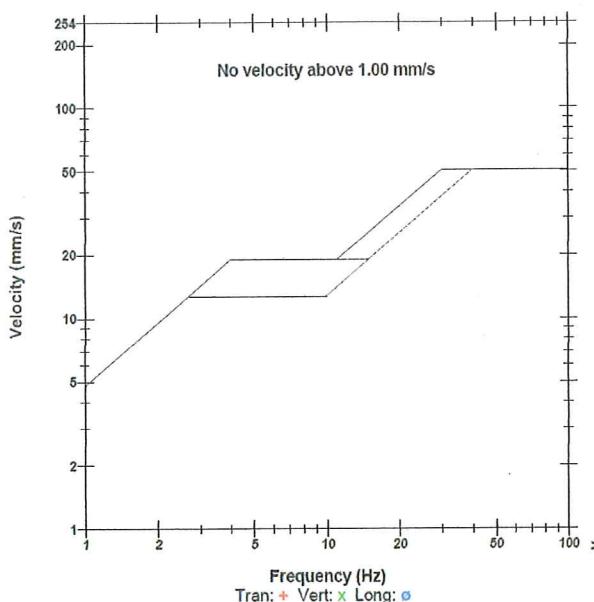
Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.127	0.0635	mm/s
PPV	29.0	33.1	27.1	dB
ZC Freq	73	4.2	>100	Hz
Time (Rel. to Trig)	4.060	9.132	1.612	sec
Peak Acceleration	0.00663	0.00663	0.00829	g
Peak Displacement	0.00066	0.00583	0.00077	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.8	Hz
Overswing Ratio	3.8	3.7	3.7	

Peak Vector Sum 0.139 mm/s at 19.945 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q5791616.HQ0

#### USBM RI8507 And OSMRE



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check

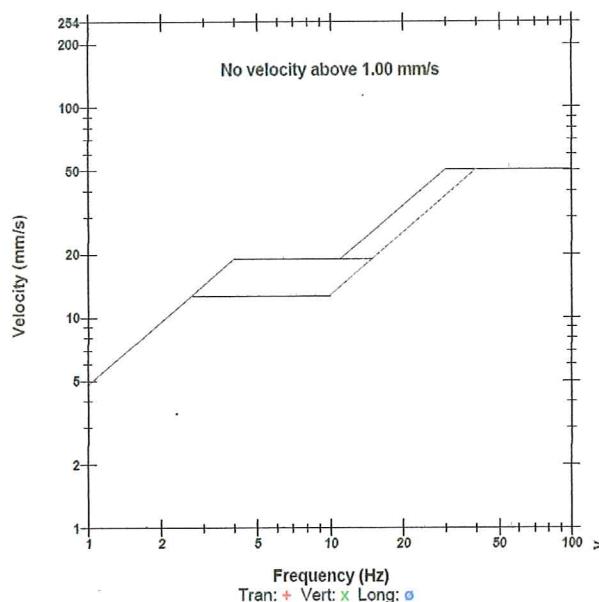


### Event Report

Date/Time Manual at 09:42:09 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1  
**Notes**  
 Location: SITIO 28 LO T2 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO28

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q5791616.Y90

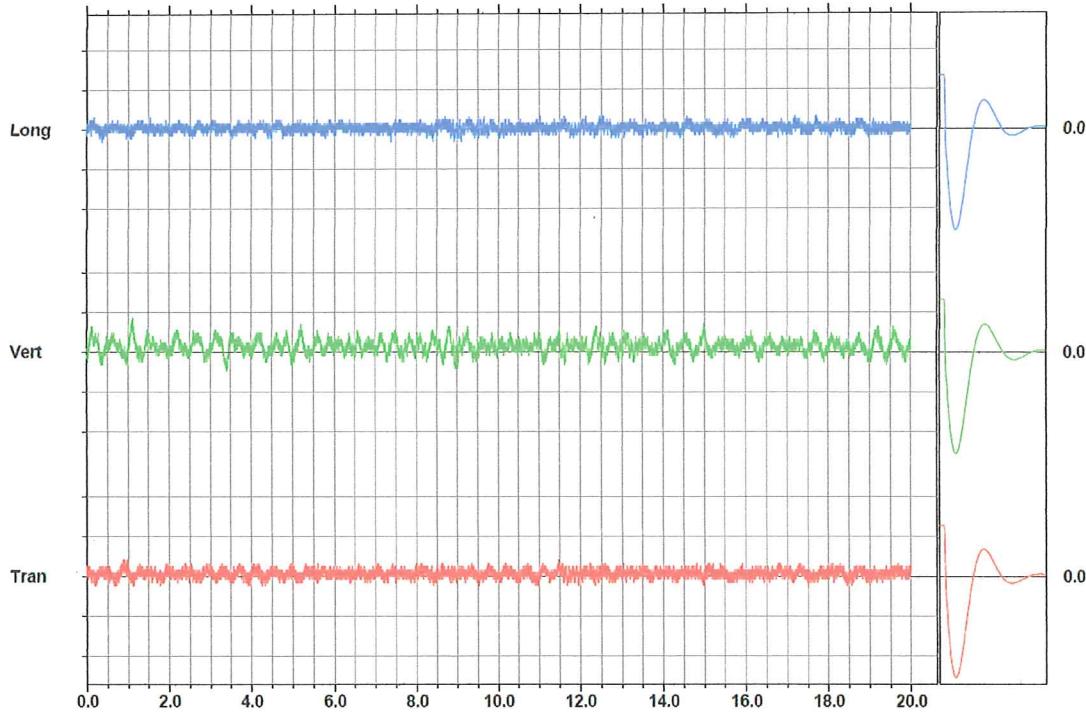
#### USBM RI8507 And OSMRE



#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.175	0.0635	mm/s
PPV	29.0	35.8	27.1	dB
ZC Freq	9.8	3.5	64	Hz
Time (Rel. to Trig)	0.879	1.113	0.183	sec
Peak Acceleration	0.00663	0.00663	0.00829	g
Peak Displacement	0.00131	0.00802	0.00046	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.7	Hz
Overswing Ratio	3.8	3.7	3.7	
Peak Vector Sum	0.177 mm/s at 1.113 sec			

Peak Vector Sum 0.177 mm/s at 1.113 sec



Sensor Check



### Event Report

Date/Time Manual at 09:32:36 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 2

Notes  
 Location: SITIO 28 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

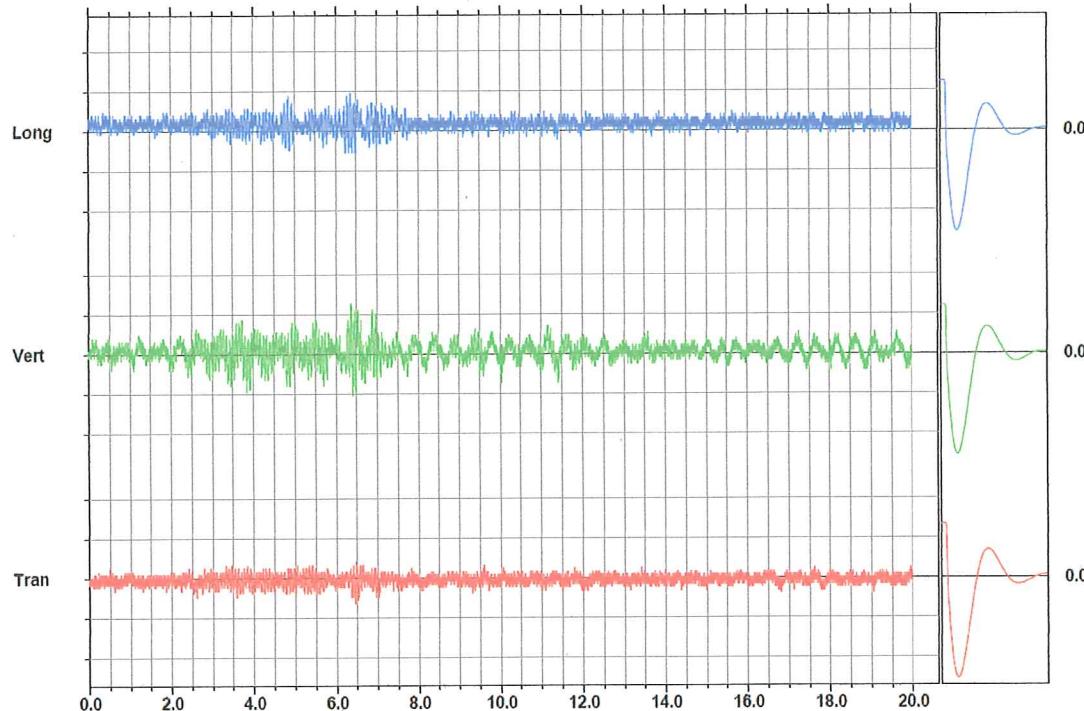
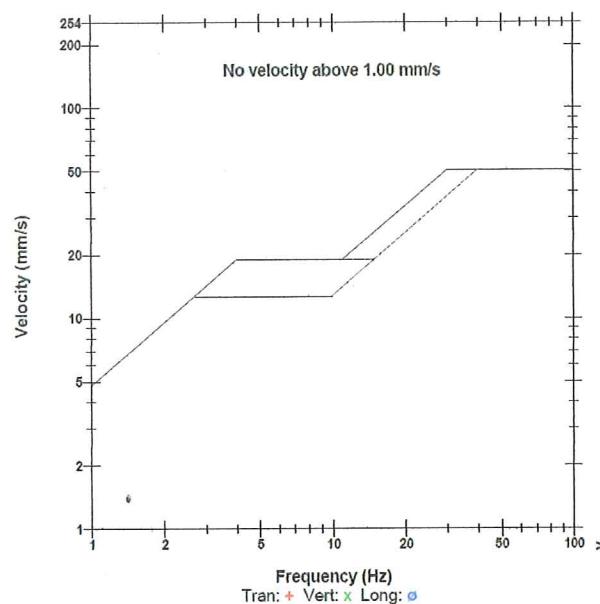
#### Extended Notes

	Tran	Vert	Long	
PPV	0.127	0.254	0.190	mm/s
PPV	33.1	39.1	36.6	dB
ZC Freq	14	12	11	Hz
Time (Rel. to Trig)	6.447	6.374	6.369	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00139	0.00404	0.00261	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.4	7.4	7.4	
Overswing Ratio	3.7	3.8	4.0	

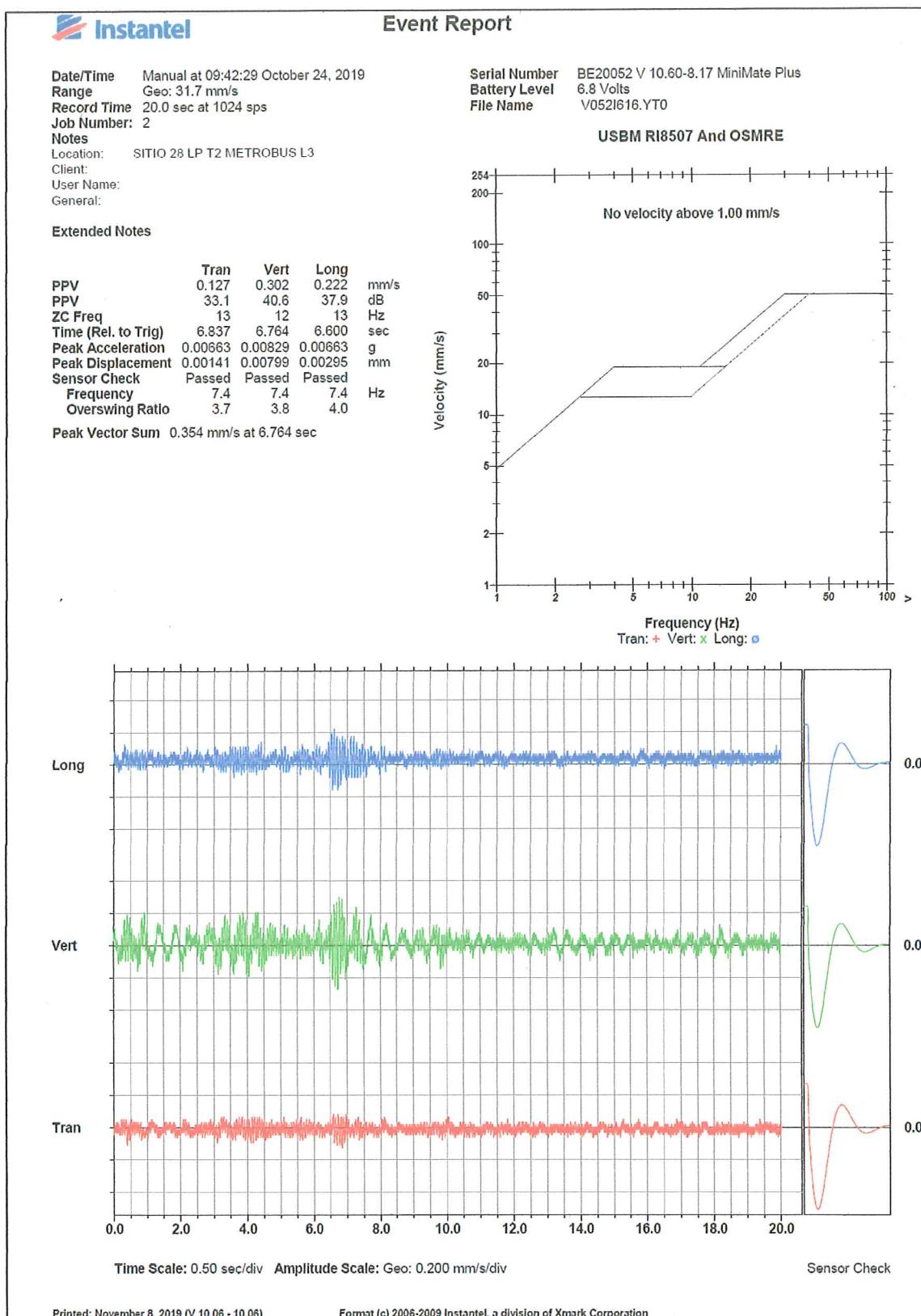
Peak Vector Sum 0.315 mm/s at 6.369 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I616.ICO

#### USBM RI8507 And OSMRE



Sensor Check





### Event Report

Date/Time Manual at 08:59:44 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 29 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO29

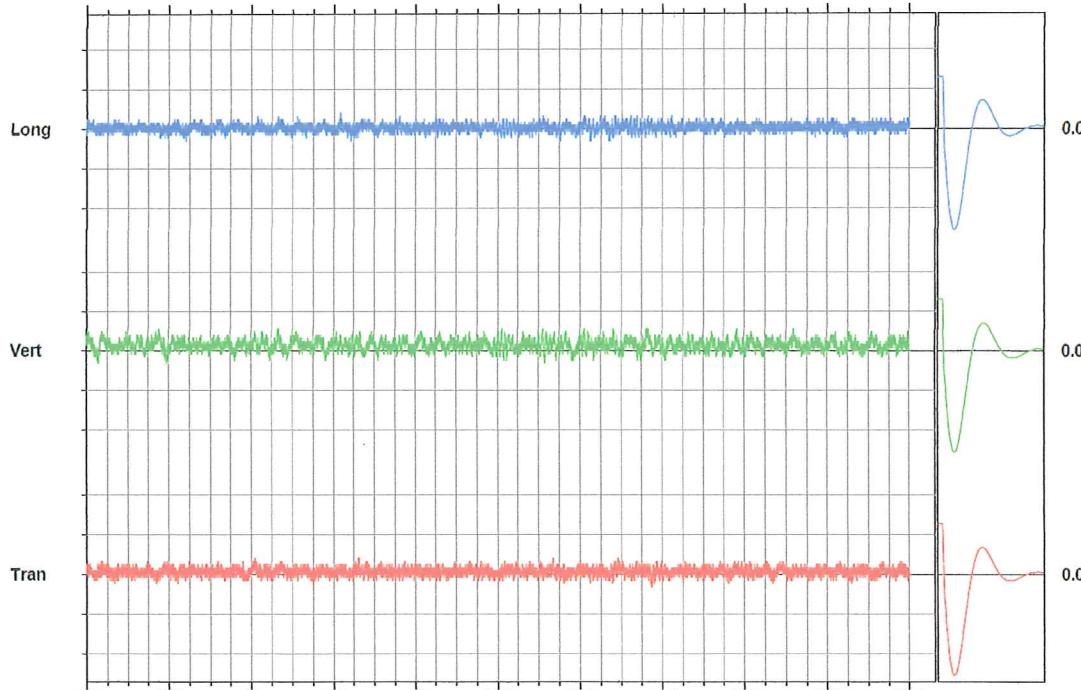
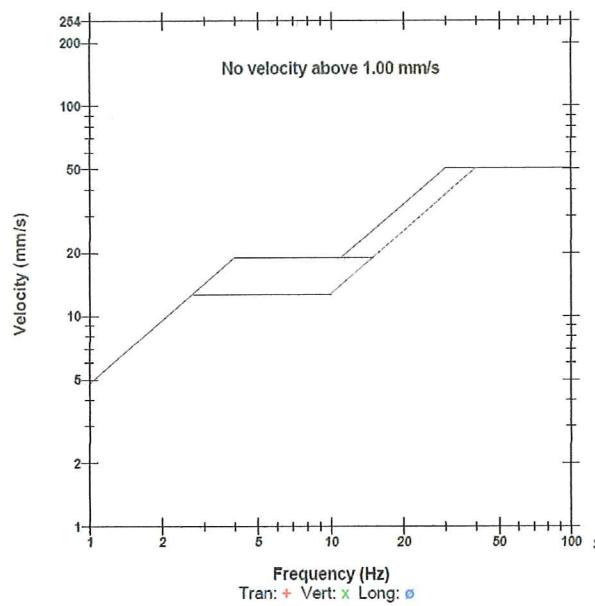
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.111	0.0794	mm/s
PPV	29.0	31.9	29.0	dB
ZC Freq	17	2.9	51	Hz
Time (Rel. to Trig)	4.084	1.765	6.162	sec
Peak Acceleration	0.00663	0.00663	0.00663	g
Peak Displacement	0.00068	0.00500	0.00036	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.5	7.8	Hz
Overswing Ratio	3.8	3.7	3.6	

Peak Vector Sum 0.130 mm/s at 12.818 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I614.ZK0

#### USBM RI8507 And OSMRE



Sensor Check



### Event Report

Date/Time Manual at 09:04:10 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

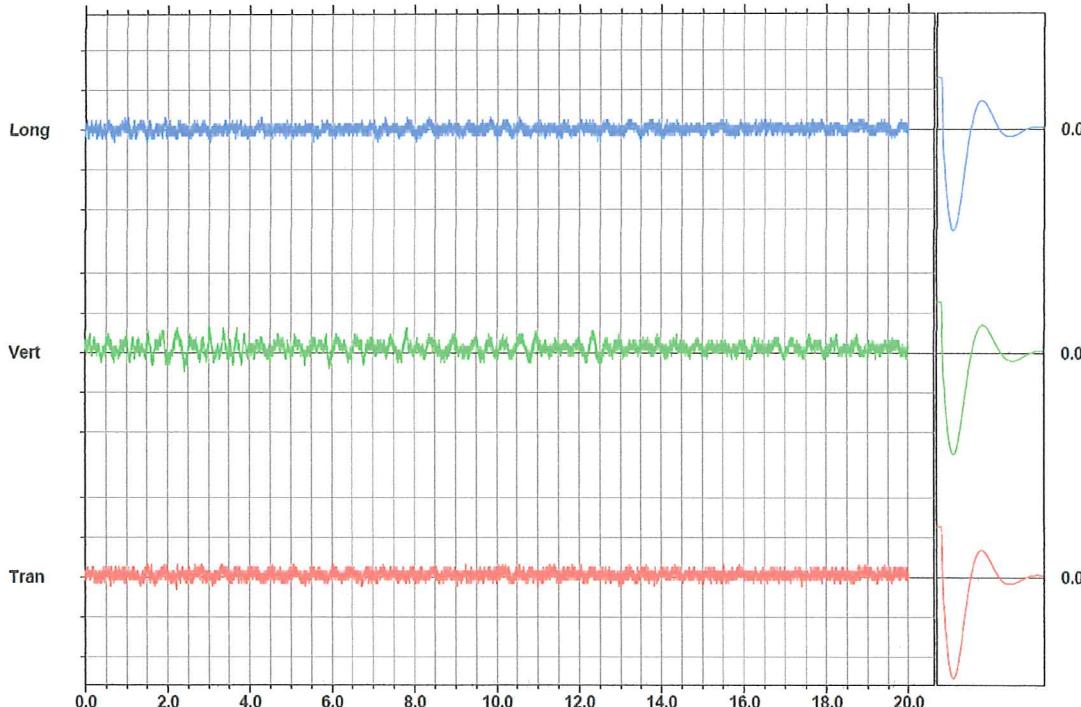
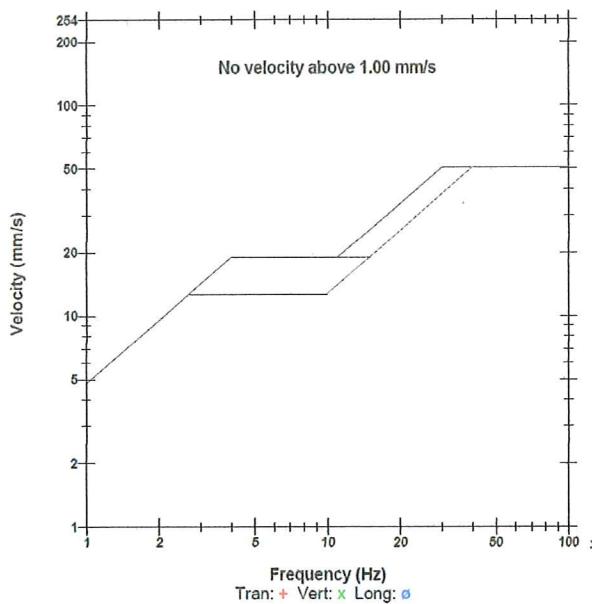
Notes  
 Location: MSITIO 29 LO T2 ETROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO29

#### Extended Notes

	Tran	Vert	Long	
PPV	0.0635	0.143	0.0635	mm/s
PPV	27.1	34.1	27.1	dB
ZC Freq	57	6.6	>100	Hz
Time (Rel. to Trig)	1.491	3.012	0.692	sec
Peak Acceleration	0.00663	0.00829	0.00829	g
Peak Displacement	0.00043	0.00571	0.00068	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.6	7.8	Hz
Overswing Ratio	3.8	3.7	3.6	
Peak Vector Sum	0.146	mm/s	at 3.012 sec	

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I615.6Y0

#### USBM RI8507 And OSMRE



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check



### Event Report

Date/Time Manual at 08:59:12 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 29 LP T1 METROBUS L3  
 Client:  
 User Name:  
 General:

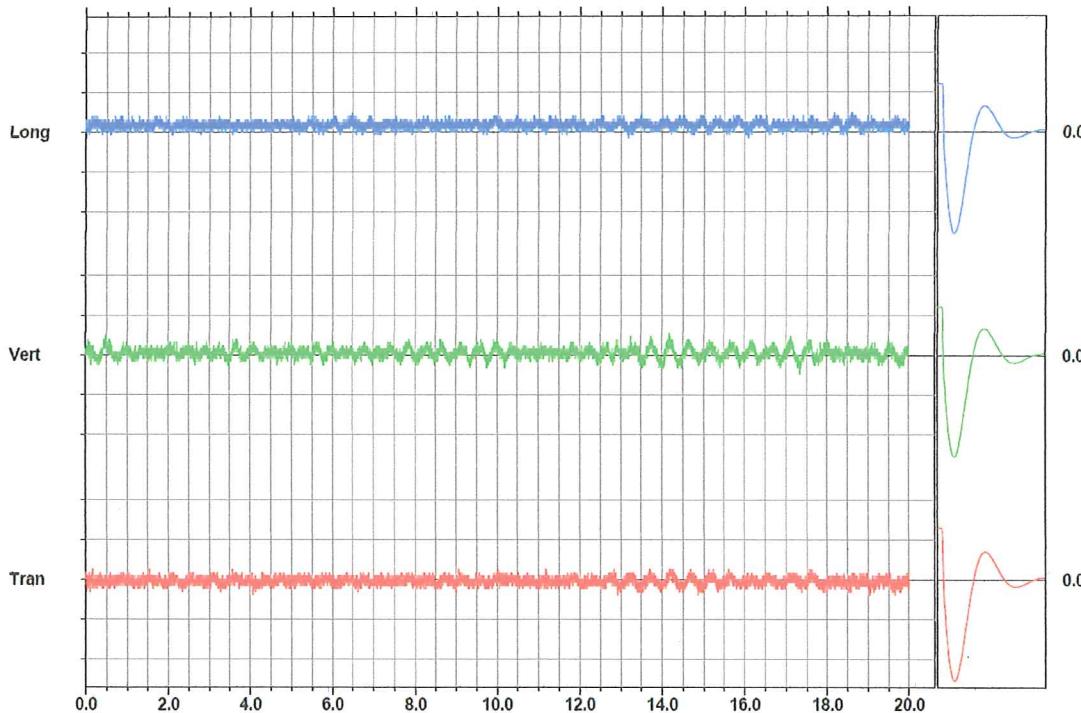
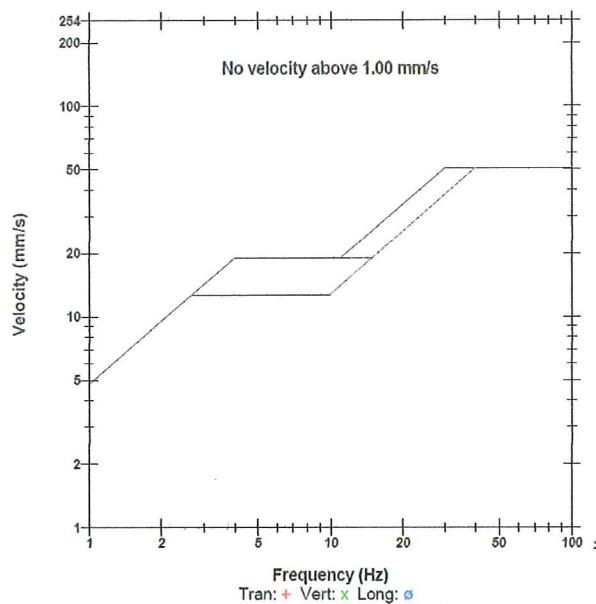
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.111	0.0952	mm/s
PPV	29.0	31.9	30.6	dB
ZC Freq	>100	4.6	5.2	Hz
Time (Rel. to Trig)	4.064	14.172	6.466	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00069	0.00306	0.00449	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.3	7.4	7.4	
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.112 mm/s at 14.172 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I614.Y00

#### USBM RI8507 And OSMRE



Sensor Check



## Event Report

Date/Time Manual at 09:07:09 October 24, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

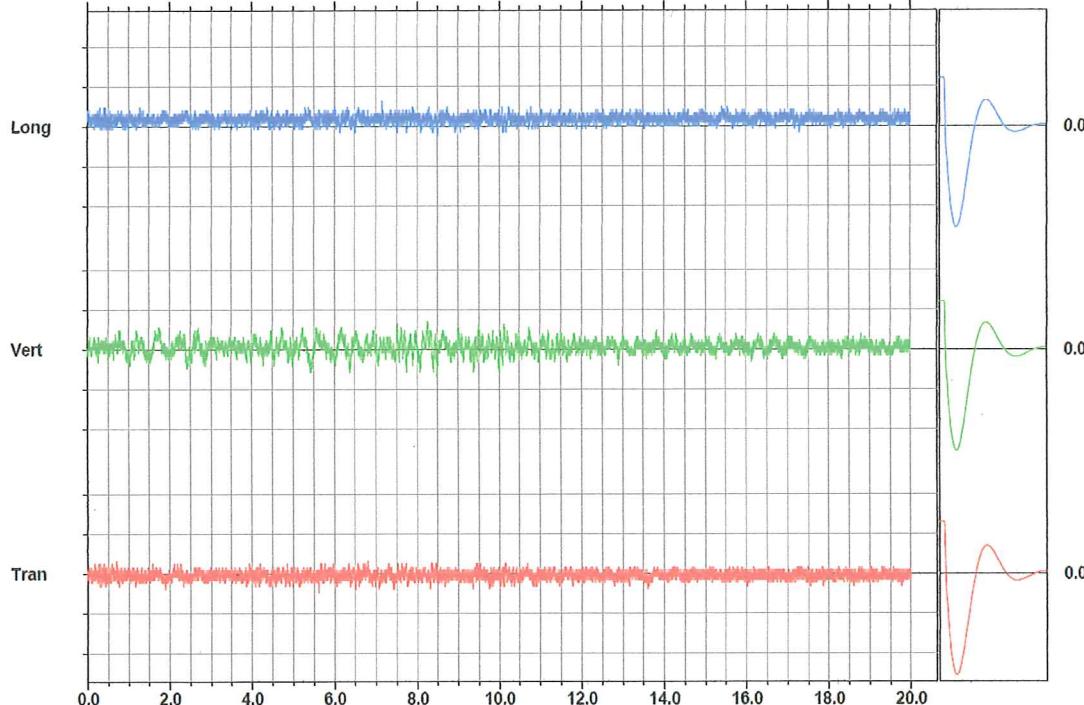
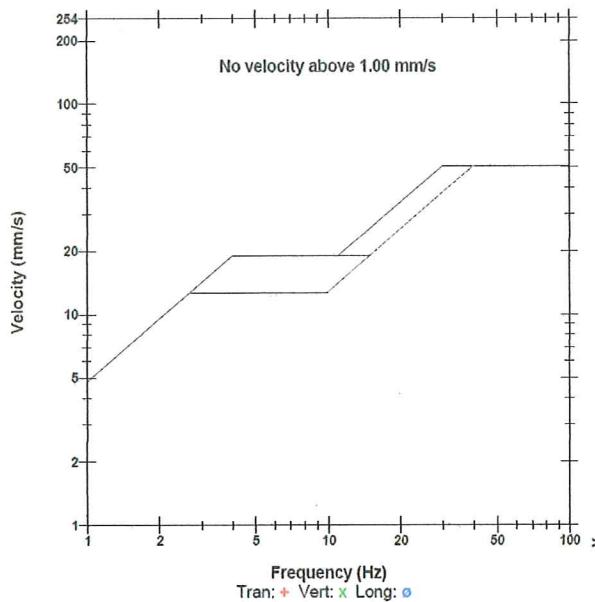
Notes  
 Location: SITIO1 29 LP T2 METROBUS L3  
 Client:  
 User Name:  
 General:

### Extended Notes

	Tran	Vert	Long	
PPV	0.0952	0.143	0.127	mm/s
PPV	30.6	34.1	33.1	dB
ZC Freq	34	6.7	12	Hz
Time (Rel. to Trig)	5.610	8.257	7.156	sec
Peak Acceleration	0.00663	0.00994	0.00663	g
Peak Displacement	0.00060	0.00516	0.00429	mm
Sensor Check	Passed	Passed	Passed	Hz
Frequency	7.3	7.4	7.4	
Overswing Ratio	3.7	3.8	4.0	
Peak Vector Sum	0.145 mm/s	at 8.257 sec		

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I615.BX0

### USBM RI8507 And OSMRE



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.200 mm/s/div

Sensor Check

 **Instantel**

### Event Report

Date/Time Manual at 18:51:23 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 30 LO T1 METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO30

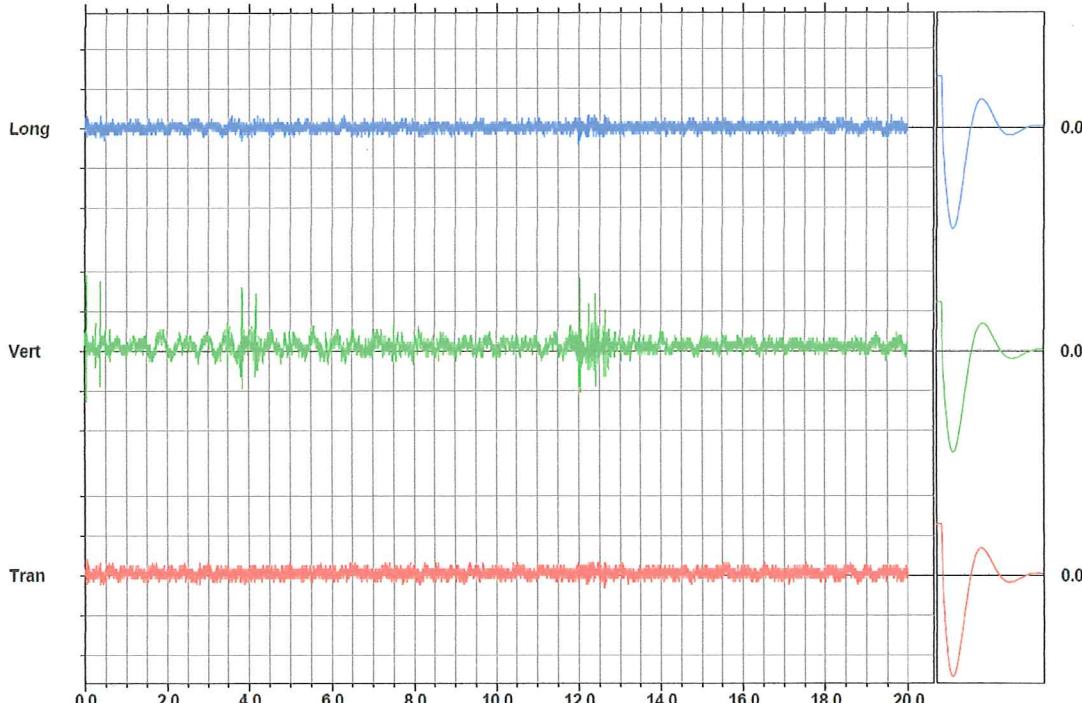
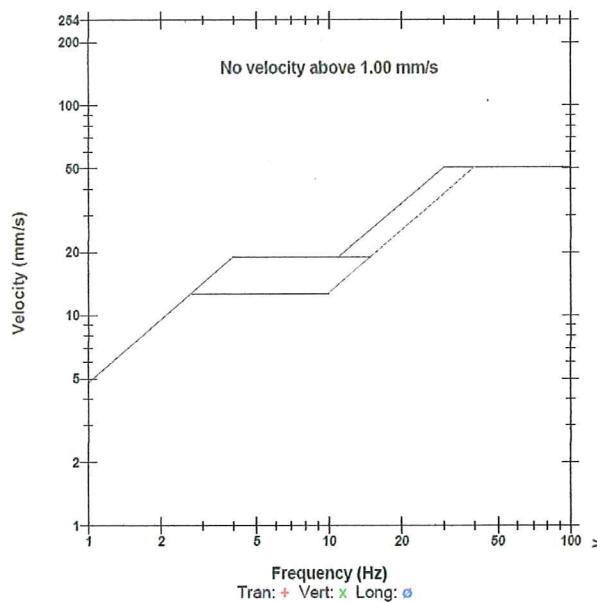
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0794	0.381	0.0794	mm/s
PPV	29.0	42.6	29.0	dB
ZC Freq	>100	>100	47	Hz
Time (Rel. to Trig)	0.048	0.037	11.989	sec
Peak Acceleration	0.00994	0.0365	0.0116	g
Peak Displacement	0.00032	0.00757	0.00027	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.5	7.7	Hz
Overswing Ratio	3.8	3.7	3.6	

Peak Vector Sum 0.382 mm/s at 0.037 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579I63R.1N0

#### USBM RI8507 And OSMRE



Sensor Check

 **Instantel**

### Event Report

Date/Time Manual at 19:06:29 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 1

Notes  
 Location: SITIO 30 LO METROBUS L3  
 Client: CEMEX  
 User Name: ROG  
 General: SITIO30

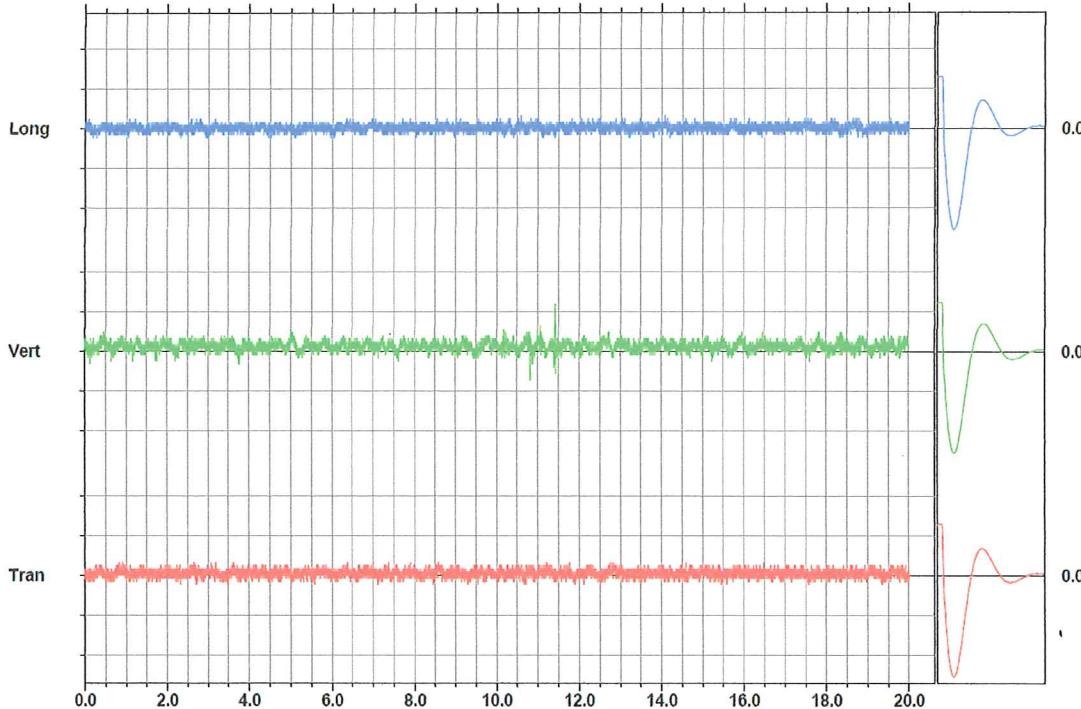
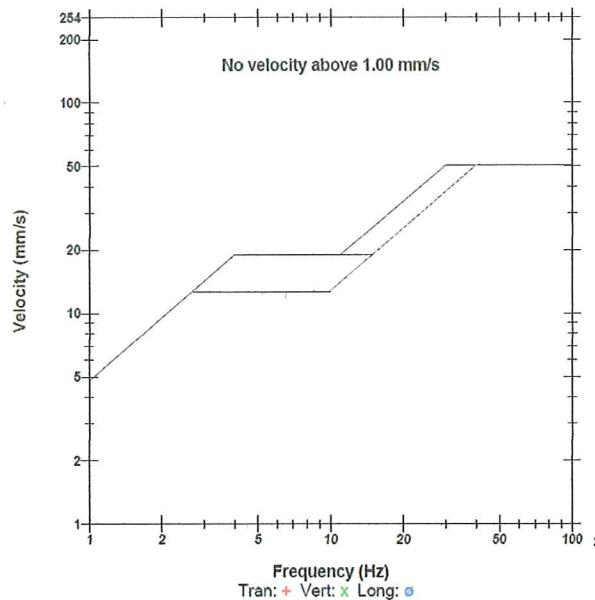
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0635	0.238	0.0635	mm/s
PPV	27.1	38.5	27.1	dB
ZC Freq	32	22	>100	Hz
Time (Rel. to Trig)	0.834	11.413	10.574	sec
Peak Acceleration	0.00663	0.00829	0.00663	g
Peak Displacement	0.00054	0.00380	0.00012	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.5	7.7	Hz
Overswing Ratio	3.8	3.7	3.6	

Peak Vector Sum 0.241 mm/s at 11.413 sec

Serial Number BE15579 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name Q579163R.QT0

#### USBM RI8507 And OSMRE



Sensor Check



**Instantel**

### Event Report

Date/Time Manual at 18:58:26 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 30

Notes  
 Location: SITIO 30 LP METROBUS L3  
 Client:  
 User Name:  
 General:

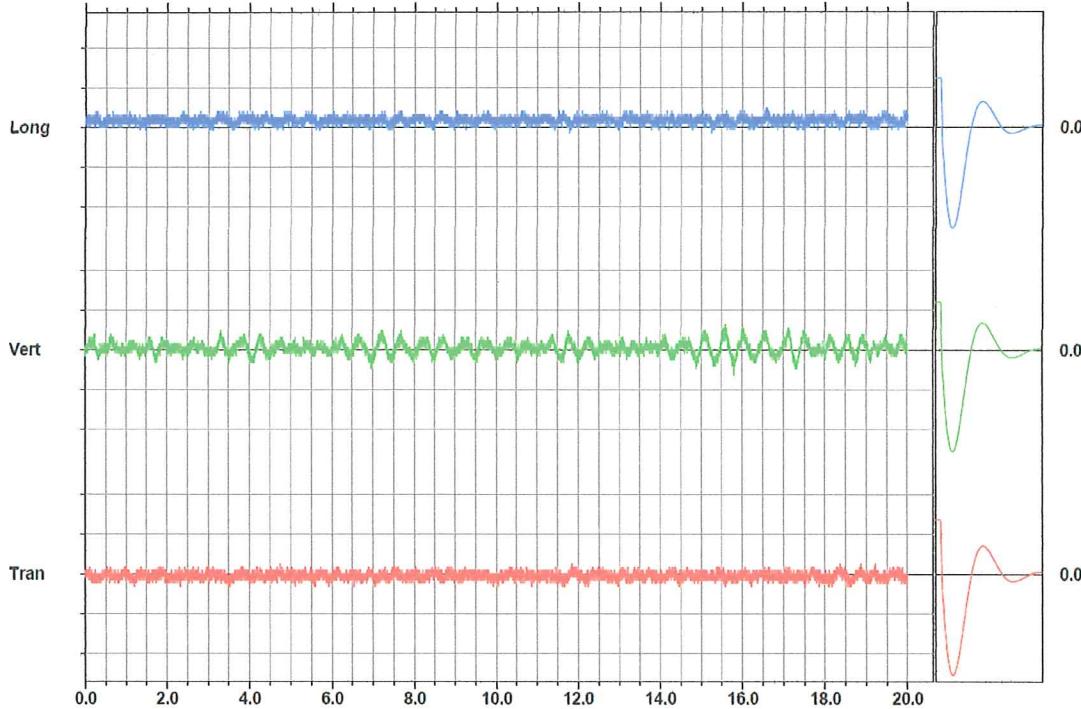
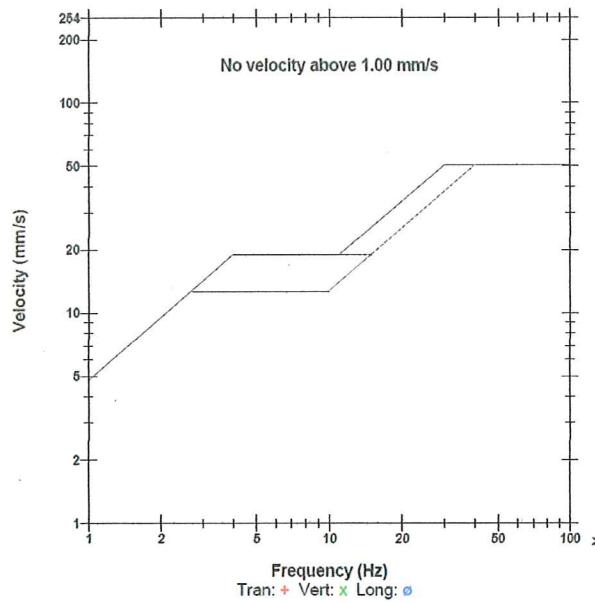
#### Extended Notes

	Tran	Vert	Long	
PPV	0.0635	0.127	0.0952	mm/s
PPV	27.1	33.1	30.6	dB
ZC Freq	>100	3.0	6.1	Hz
Time (Rel. to Trig)	1.198	15.583	16.556	sec
Peak Acceleration	0.00663	0.00663	0.00663	g
Peak Displacement	0.00067	0.00608	0.00240	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 0.132 mm/s at 15.585 sec

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I63R.DE0

#### USBM RI8507 And OSMRE



Sensor Check

 **Instantel**

### Event Report

Date/Time Manual at 19:00:10 October 25, 2019  
 Range Geo: 31.7 mm/s  
 Record Time 20.0 sec at 1024 sps  
 Job Number: 30

Serial Number BE20052 V 10.60-8.17 MiniMate Plus  
 Battery Level 6.8 Volts  
 File Name V052I63R.GA0

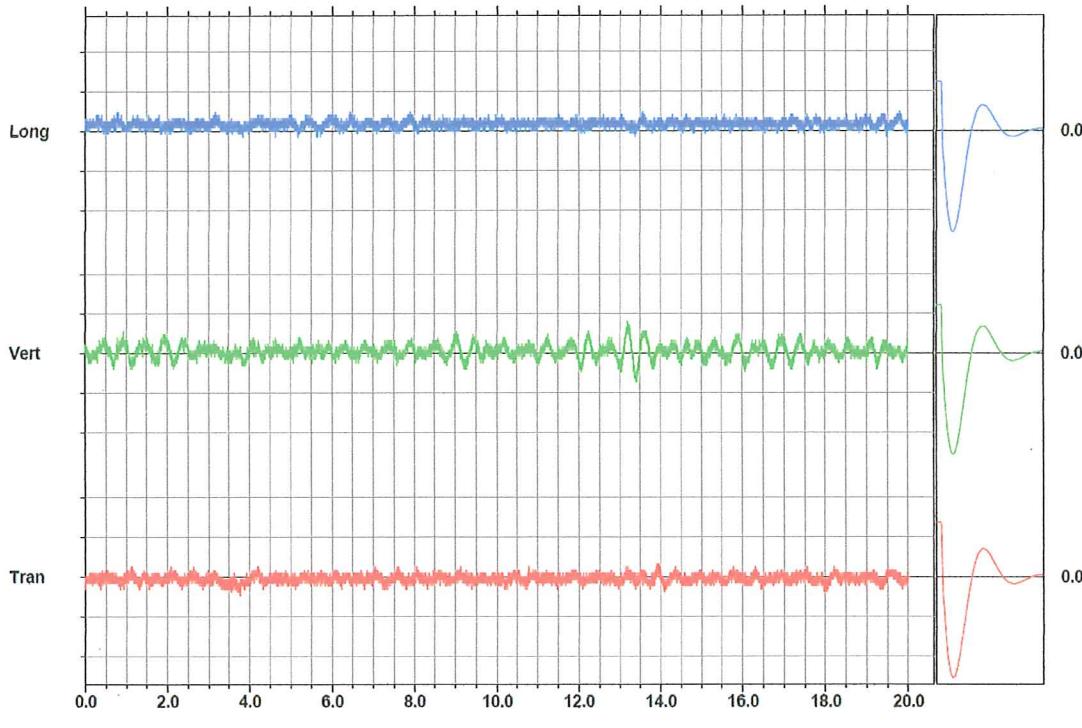
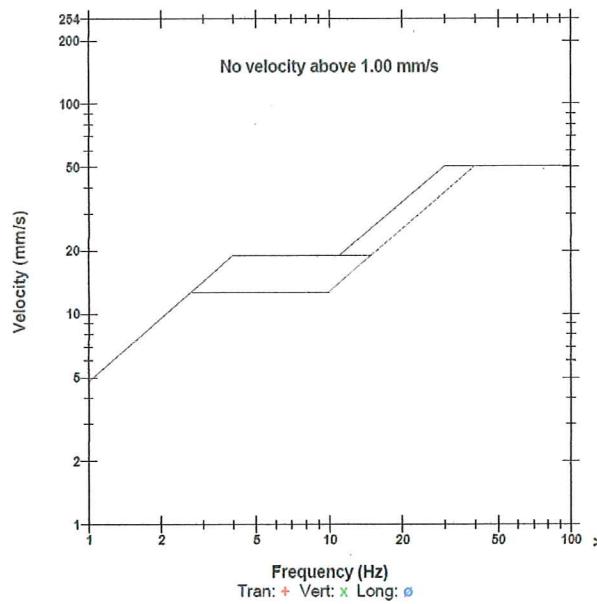
#### USBM RI8507 And OSMRE

Notes  
 Location: SITIO 30 LP  
 Client:  
 User Name:  
 General:

#### Extended Notes

	Tran	Vert	Long	mm/s
PPV	0.0952	0.159	0.0952	mm/s
PPV	30.6	35.0	30.6	dB
ZC Freq	6.0	3.0	13	Hz
Time (Rel. to Trig)	3.766	13.196	0.770	sec
Peak Acceleration	0.00829	0.00663	0.00829	g
Peak Displacement	0.00215	0.00820	0.00478	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.4	7.4	Hz
Overswing Ratio	3.7	3.8	4.0	

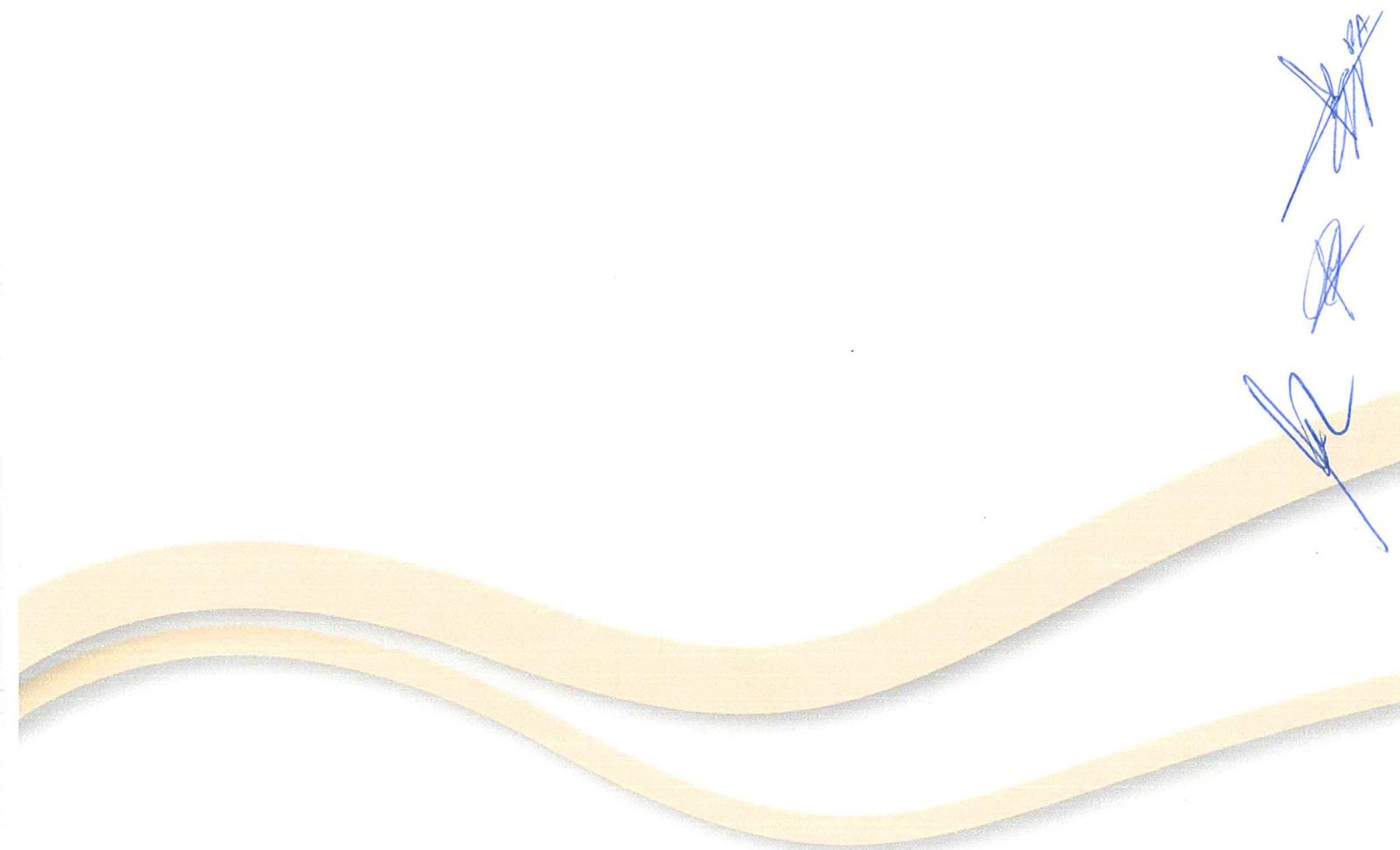
Peak Vector Sum 0.162 mm/s at 13.196 sec



Sensor Check

## Anexo B

### Reporte Fotográfico



**PROYECTO:**

## ESTUDIO DE VIBRACIÓN AMPLIACIÓN L3 METROBÚS

SUPERVISOR: ING. JOSE ANTONIO SALGADO  
PERFORADORA: N/A  
PROFUNDIDAD EXPLORADA: N/A  
FECHA EJECUCIÓN: NOVIEMBRE 2019



Figura 1. Terminal Hospital General Xoco



Figura 2. Av Cuauhtémoc y Calle Carrillo Puerto

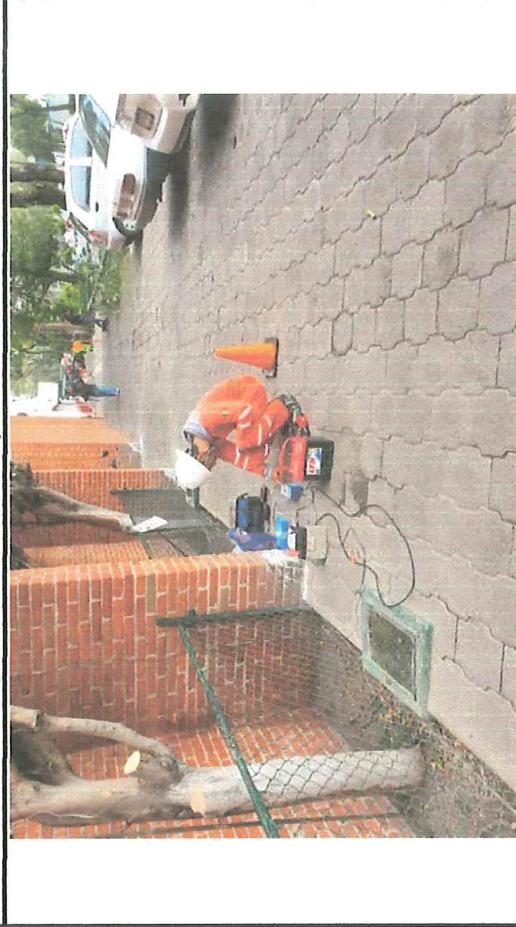


Figura 3. Av Cuauhtémoc y Calle Palomar



Figura 4. Av Cuauhtémoc y Eje 8 Sur Popocatépetl



**PROYECTO:**

**ESTUDIO DE VIBRACIÓN AMPLIACIÓN L3 METROBÚS**

SUPERVISOR: ING. JOSÉ ANTONIO SALGADO  
PERFORADORA: N/A  
PROFOUNDIDAD EXPLORADA: N/A  
FECHA EJECUCIÓN: NOVIEMBRE 2019



Figura 5. Av Cuauhtémoc y Calle Pilares



Figura 6. Av Cuauhtémoc y División del Norte



Figura 7. Estación División del Norte



Figura 8. Av Cuauhtémoc y Angel Urraza



*[Handwritten signatures and initials are visible along the right margin]*

**PROYECTO:**

**ESTUDIO DE VIBRACIÓN AMPLIACIÓN L3 METROBÚS**



SUPERVISOR: ING. JOSE ANTONIO SALGADO  
PROFUNDIDAD EXPLORADA: N/A  
FECHA EJECUCIÓN: NOVIEMBRE 2019

Figura 9. Av Cuauhémoc y San Borja



Figura 10. Av Cuauhémoc entre San Borja y Eugenia

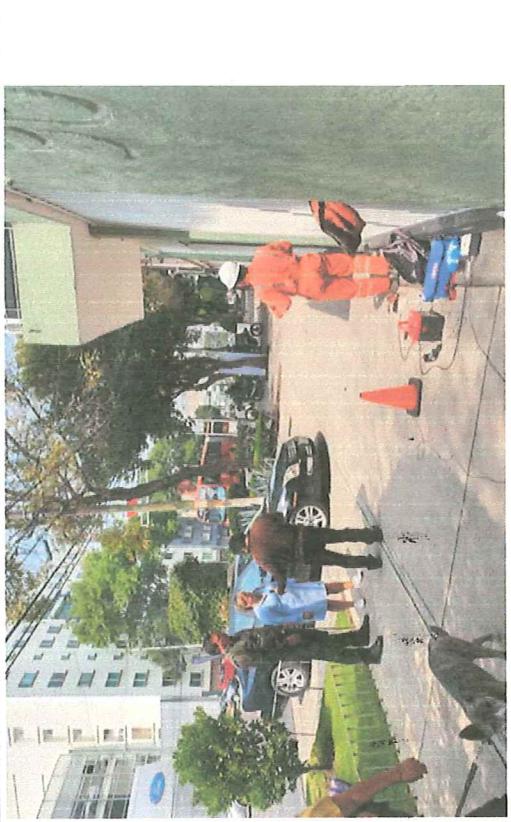
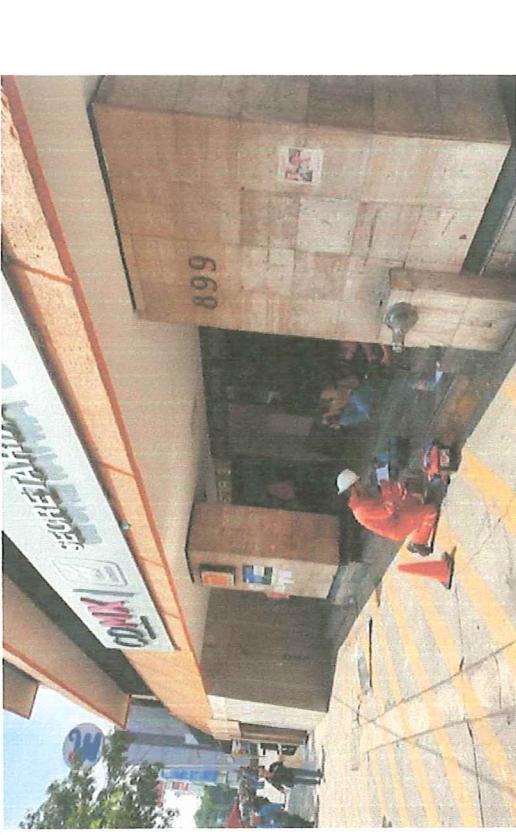


Figura 11. Av Cuauhémoc y Eugenia



Figura 12. Av Cuauhémoc entre Eugenia y Concepcion Beistegui



**PROYECTO:**

**ESTUDIO DE VIBRACIÓN AMPLIACIÓN L3 METROBÚS**

SUPERVISOR: ING. JOSE ANTONIO SALGADO  
PERFORADORA: NIA  
PROFOUNDIDAD EXPLORADA: NIA  
FECHA EJECUCIÓN: NOVIEMBRE 2019



Figura 13. Av Cuauhtémoc y Concepcion Beistegui



Figura 14. Av Cuauhtémoc y Torres Adalid

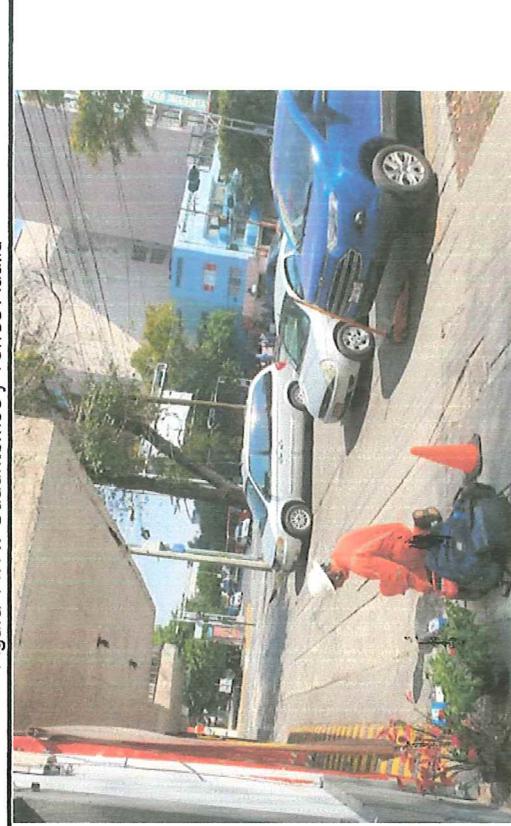


Figura 15. Av Cuauhtémoc y Luz Saviñon

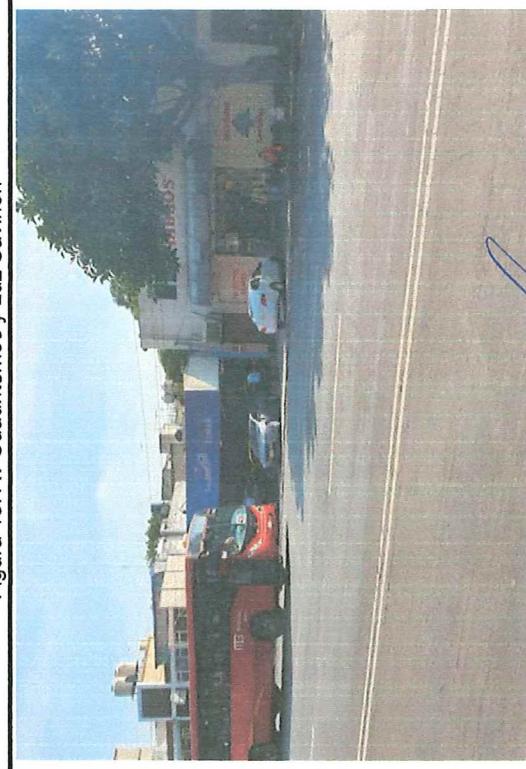


Figura 16. Estación Luz Saviñon

