FD-11634 Specifications

2025-07-07

Contents

FD-11634 Specifications

FD-11634 Specifications

These specifications apply to the FD-11634.

Revision History

Version	Date changed	Description
377651C-01	June 2025	Added pinout.
377651B-01	June 2019	Updated butterworth filter table and graph.
377651A-01	February 2019	Initial release.

Looking For Something Else?

For information not found in the specifications for your product, such as operating instructions, browse ***Related Information***.

Related information:

- FD-11634 User Manual
- FD-11634 Calibration Procedure
- NI-DAQmx User Manual
- Software and Driver Downloads
- Release Notes
- License Setup and Activation
- Dimensional Drawings
- Product Certifications
- Letter of Volatility
- Discussion Forums
- NI Learning Center

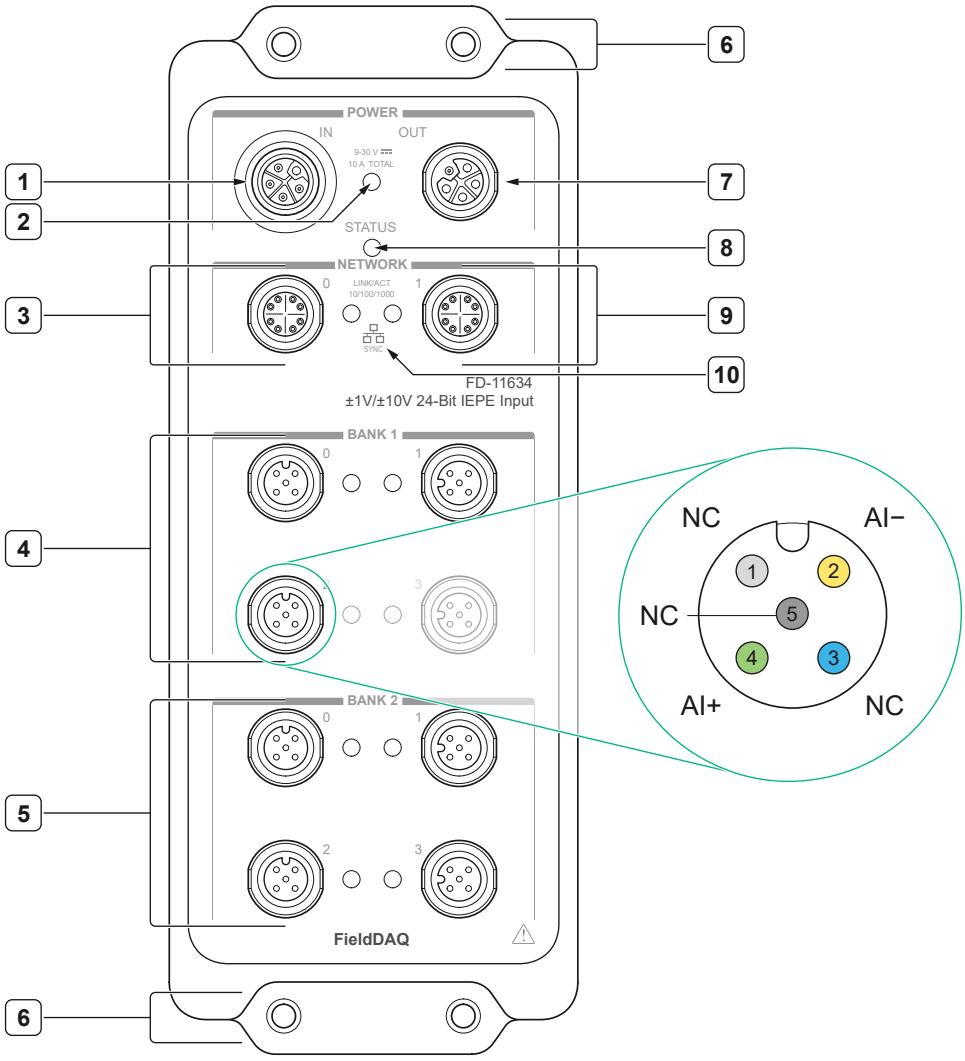
Conditions

Specifications are typical and valid at -40 °C to 85 °C unless otherwise noted.

FD-11634 Front Panel

Use the front panel to locate the connectors, LEDs, and mounting holes on the FD-11634.

Figure 1. FD-11634 Front Panel



1. Power IN Connector
2. Power LED
3. Ethernet Port 0 and LED
4. Bank 1 Input Connectors 0 through 3 and LEDs

5. Bank 2 Input Connectors 0 through 3 and LEDs
6. Mounting Holes
7. Power OUT Connector
8. STATUS LED
9. Ethernet Port 1 and LED
10. SYNC Logo

FD-11634 Signal Input Connectors Pinout

The FD-11634 features eight 5-pin A-coded M12 connectors: Bank 1 connectors 0 through 3 and Bank 2 connectors 0 through 3. The following figure shows the pinout of a signal input connector.

Figure 2. FD-11634 Pinout

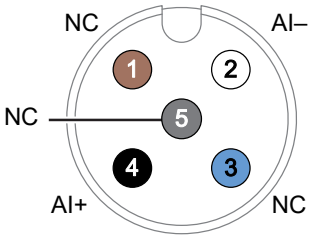


Table 1. Signal Descriptions

Pin Number	Wire Color*	Signal	Description
1	Brown	NC	No connect. Do not connect signals to this terminal.
2	White	AI-	Negative analog input signal and TEDS return.
3	Blue	NC	No connect. Do not connect signals to this terminal.
4	Black	AI+	Positive analog input signal and TEDS data.
5	Gray	NC	No connect. Do not connect signals to this terminal.

* Wire color pertains to SHM125M I/O cables sold through NI. Other manufacturers' cable wire colors may vary.

Notice M12 connectors must be mated to cables or have caps installed on them to meet IP65/IP67 requirements. Cover the unused connectors with the included plastic caps whenever water, dust, or dirt are present.

Power Connector Pinout

The following figure shows the pinout of the Power IN connector.

Figure 3. Power Connector Pinout

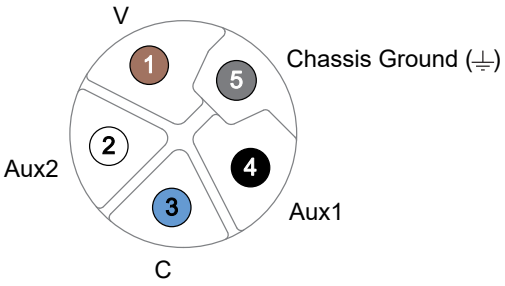


Table 2. Signal Descriptions

Pin Number	Wire Color*	Signal	Description
1	Brown	V	Positive voltage line
2	White	Aux2	Optional line for powering non-FieldDAQ devices
3	Blue	C	Common. Negative voltage line
4	Black	Aux1	Optional line for powering non-FieldDAQ devices
5	Gray	⏚	Chassis Ground. This terminal is internally connected to the C terminal.

* Wire color pertains to M125F power cables sold through NI. Other manufacturers' cable wire colors may vary.

Ethernet Ports

The FD-11634 has two 8-pin X-coded M12 Ethernet ports—0 and 1.

You can use a shielded straight-through Ethernet or an Ethernet crossover cable with either of the Ethernet ports to network your device to a computer host, NI Linux Real-Time controller, another FieldDAQ device, or any network connection on the same subnet. Refer to ***Topology Options*** for more information about using these ports in various topologies.

Figure 4. Ethernet Connector Pinout

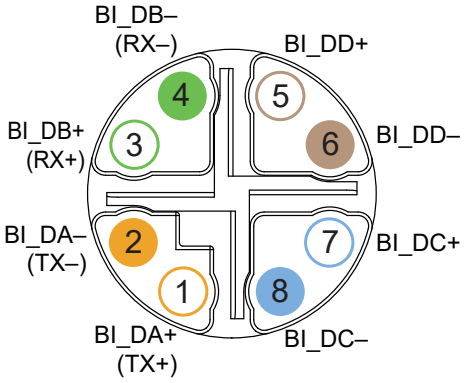


Table 3. Signal Descriptions

Pin Number	Wire Color	Gigabit Ethernet Signal	Fast Ethernet Signal
1	Orange/White	BI_DA+	TX+
2	Orange	BI_DA-	TX-
3	Green/White	BI_DB+	RX+
4	Green	BI_DB-	RX-
5	Brown/White	BI_DD+	No Connect
6	Brown	BI_DD-	No Connect
7	Blue/White	BI_DC+	No Connect
8	Blue	BI_DC-	No Connect

You can use the Ethernet ports to reset the FieldDAQ device to factory-default settings. Refer to ***Resetting the FieldDAQ to Factory-Default Settings*** for more information.

Cap the Ethernet ports when not in use.

Related information:

- Topology Options
- Resetting the FieldDAQ to Factory-Default Settings

Cable Pinout

You can use the SHM125M-BNCF and SHM125M-BNCF-RA cables with the FD-11634.

The following figure shows the pinouts for the M12 and BNC connector on the cables.

Figure 5. SHM125M-BNCF and SHM125M-BNCF-RA Cable Pinout

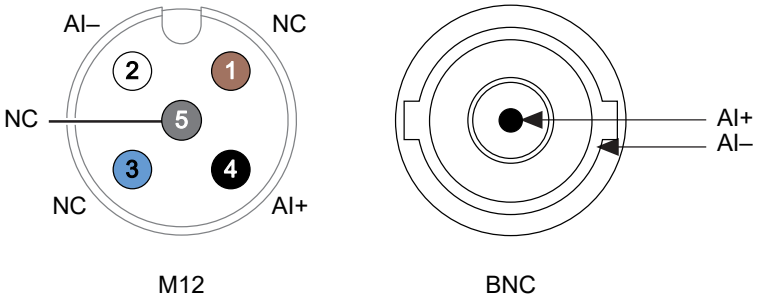


Table 4. Signal Descriptions

M12 Connector Pin Number	BNC Connector	Wire Color	Signal	Description
1	—	Brown	NC	No connect. Do not connect signals to this terminal.
2	BNC Shield	White	AI-	Negative analog input signal and TEDS return
3	—	Blue	NC	No connect. Do not connect signals to this terminal.
4	BNC Pin	Black	AI+	Positive analog input signal and TEDS data
5	—	Gray	NC	No connect. Do not connect signals to this terminal.

Notice Adhere to ESD handling precautions when using the M12-BNC cable with the FieldDAQ device.

Refer to the ***SHM125M-BNCF Cable Safety, Environmental, and Regulatory Information*** or ***SHM125M-BNCF-RA Cable Safety, Environmental, and Regulatory Information*** for information about using these cables with your

FieldDAQ device.

Input Characteristics

Number of channels	8 analog input channels
Isolation	Galvanic isolation between channels and to chassis
Input voltage range (AI+ to AI-)	±10 V, ±1 V
ADC resolution	24 bits
Type of ADC	Delta-Sigma (with analog prefiltering)
Sample mode	Simultaneous
Input coupling	Software-selectable AC/DC
TEDS support	IEEE 1451.4 TEDS Class I
TEDS capacitive drive	5,000 pF

Table 5. Timebases (f_M)

Frequency	13.1072 MHz, 12.8 MHz, 12.288 MHz, 10.24 MHz
Accuracy	±30 ppm maximum

Base clocks can be synchronized with other FieldDAQ devices as well as CompactDAQ, CompactRIO, and other devices that support TSN network synchronization.

Table 6. Sampled Data Rate Range (f_S)

Minimum	500 Sample/s
Maximum	102.4 kSample/s

Sampled data rates (f_S)	Refer to the following table for sample data rates supported for each timebase

Table 7. Timebases (f_M) and Supported Sampled Data Rates (f_S), (kSamples/s)

13.1072 MHz	12.8 MHz	12.288 MHz	10.24 MHz
102.4	100.0	96.0	80.0
51.2	50.0	48.0	40.0
34.133	33.333	32.0	26.667
25.6	25.0	24.0	20.0*
20.48	20.0	19.2	16.0
17.067	16.667	16.0*	13.333
12.8	12.5	12.0	10.0*
10.24	10.0	9.6	8.0
8.533	8.333	8.0*	6.667
6.4	6.25	6.0	5.0*
5.12	5.0	4.8	4.0
4.267	4.167	4.0*	3.333
3.2	3.125	3.0	2.5*
2.56	2.5	2.4	2.0
2.133	2.083	2.0*	1.667
1.6	1.563	1.5	1.25*
1.28	1.25	1.2	1.0
1.067	1.042	1.0*	0.833
0.8	0.781	0.75	0.625
0.64	0.625	0.6	0.5

Note For sample rates that can be obtained using two different timebases, the lowest noise (highest resolution) option is indicated with an asterisk (*).

Input impedance (AI+ to AI-)	1 MΩ
Input capacitance (AI+ to AI-)	520 pF

Table 8. AC Coupling Response

-3 dB	0.53 Hz
-0.1 dB	3.48 Hz

Table 9. Accuracy

Nominal Input Range	Temperature	Gain Error (% of Reading)	DC-Coupled Offset Error (% of Range, mV)
±10 V	5 °C to 40 °C	0.05%, typical	0.012%, 1.2 mV, typical
		0.1%, maximum	0.028%, 2.8 mV, maximum
	-40 °C to 85 °C	0.15%, maximum	0.0078%, 7.8mV, maximum
±1 V	5 °C to 40 °C	0.06%, typical	0.02%, 0.2 mV, typical
		0.12%, maximum	0.04%, 0.4 mV, maximum
	-40 °C to 85 °C	0.2%, maximum	0.14%, 1.4 mV, maximum

Table 10. AC-coupled Residual Offset

5 °C to 40 °C	<5 mV typical
-40 °C to 85 °C	<50 mV typical

Table 11. Stability

Input Range	Gain Drift	DC-Coupled Offset Drift
±10 V	±15 ppm/°C	±50 µV/°C
±1 V	±20 ppm/°C	±15 µV/°C

Gain mismatch (channel-to-channel, DC to 40 kHz)	0.1 dB maximum
Phase mismatch (channel-to-channel, 1 kHz to 40 kHz)	0.017°/kHz maximum

Phase nonlinearity (f_S = 102.4 kSample/s, 1 kHz to 40 kHz)	0.18° maximum
Crosstalk (1 kHz)	-120 dB
CMRR to chassis/earth (f_{in} = 60 Hz)	105 dB

Table 12. Input Noise with Brickwall Filter

Input Range	1 kSample/s	10 kSample/s	102.4 kSample/s
±10 V	6.0 µV RMS	9 µV RMS	25 µV RMS
±1 V	0.7 µV RMS	1.2 µV RMS	3.5 µV RMS

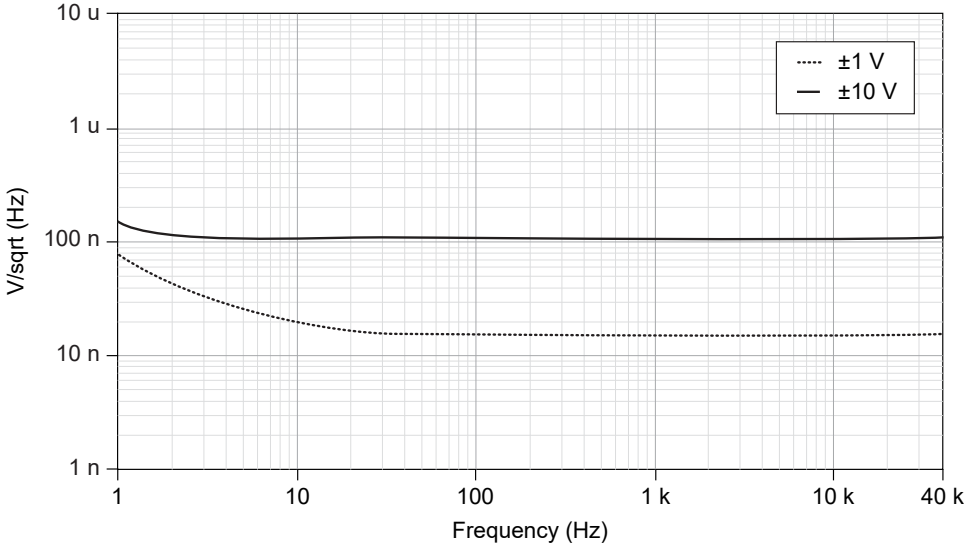
Table 13. Dynamic Range (at 1 kHz Input Frequency, -60 dBF Amplitude) with Brickwall Filter

Data Rate (kSample/s)	ADC Decimation Ratio	Input Range	
		±10 V	±1 V
102.4	64	108	106
51.2	128	111	109
25.6	256	114	112
12.8	512	117	115
6.4	1,024	120	118

Table 14. Spectral Noise Density (f_S = 102.4 kSample/s)

±10 V input range	$\frac{120nV}{\sqrt{Hz}} at 1 kHz$
±1 V input range	$\frac{16nV}{\sqrt{Hz}} at 1 kHz$

Figure 6. Spectral Noise Density versus Frequency



Spurious Free Dynamic Range (SFDR), (1 kHz, -60 dBFS)	>130 dBFS

Table 15. Total Harmonic Distortion (THD)

Input Range	1 kHz	20 Hz to 20 kHz	20 kHz to 40 kHz
±10 V	-105 dB	-98 dB	-90 dB
±1 V	-105 dB	-88 dB	-75 dB

Table 16. Total Harmonic Distortion + N (THD+N)

Input Range	20 Hz to 20 kHz	20 kHz to 40 kHz
±10 V	-98 dB	-90 dB
±1 V	-88 dB	-75 dB

Table 17. Intermodulation Distortion (IMD)

Input Range	SMPTE 60 Hz + 7 kHz	CCIF 11 kHz + 12 kHz
±10 V	-98 dB	-93 dB
±1 V	-98 dB	-85 dB

Test standards: SMPTE 60 Hz + 7 kHz, amplitude ratio 4:1 with total amplitude at 0 dBFS, and CCIF 11 kHz + 12 kHz, amplitude ratio 1:1 with each tone amplitude at

-6 dBFS, up to 5th order harmonic.

IEPE

Table 18. Excitation Current (Software-Selectable On/Off)

Minimum	4 mA
Typical	4.17 mA

Excitation noise	4 nA RMS, 0.1 Hz to 40 kHz BW

Table 19. Short Circuit Detection

Detection threshold (AI+ to AI-)	180 mV
Detection threshold hysteresis	50 mV

Compliance voltage	23 V maximum

Note If you are using an IEPE sensor, use the following equation to ensure your configuration meets the IEPE compliance voltage range: ($V_{bias} \pm V_{full\text{-}scale}$) must be 0 V to 23 V where V_{bias} is the bias voltage of the IEPE sensor, and $V_{full\text{-}scale}$ is the full-scale voltage of the IEPE sensor.

Filtering

Brickwall Filter (Default)

Input delay	$36/f_S + 1.5\ \mu s$
Input delay tolerance	±100 ns
Passband frequency	DC to $0.4 \cdot f_S$

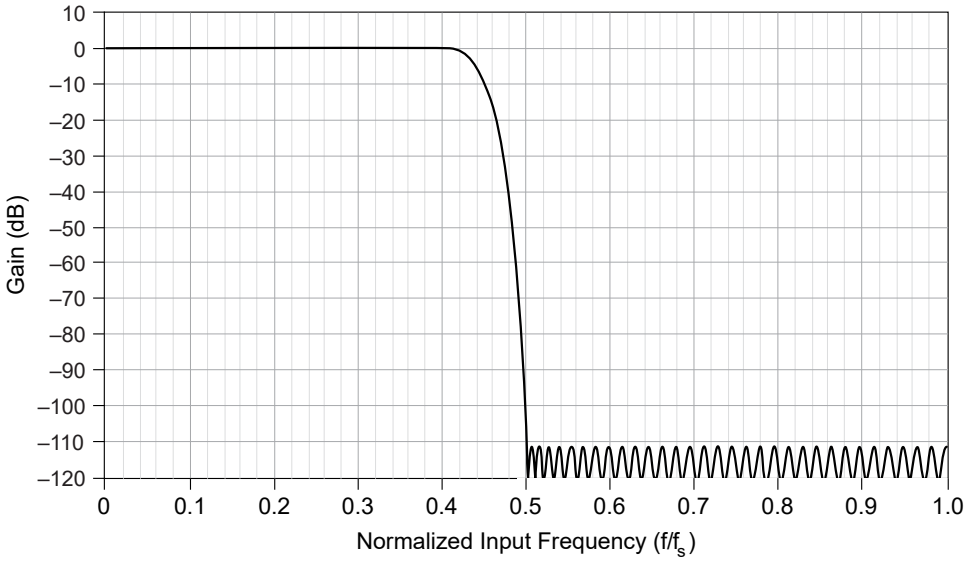
Table 20. Brickwall Filter Passband Flatness with Frequency

20 Hz to 20 kHz	±0.03 dB maximum

20 kHz to 40 kHz	±0.05 dB maximum

Stopband frequency	At or above 0.5 · f_S
Stopband rejection	≥100 dB
Alias-free bandwidth	0.5 · f_S

Figure 7. Brickwall Filter Magnitude Response



Butterworth Filter

Input delay	Refer to the ***Butterworth Filter Input Delay for Available Timebases (f_M)*** table.
Input delay tolerance	±100 ns
Filter order	2nd or 4th order

Table 21. Butterworth Filter Cutoff Frequencies (-3 dB Point) for Available Timebases

13.1072 MHz	12.8 MHz	12.288 MHz	10.24 MHz
4,096 Hz	4,000 Hz	3,840 Hz	3,200 Hz
2,048 Hz	2,000 Hz	1,920 Hz	1,600 Hz
1,024 Hz	1,000 Hz	960 Hz	800 Hz

13.1072 MHz	12.8 MHz	12.288 MHz	10.24 MHz
512 Hz	500 Hz	480 Hz	400 Hz
256 Hz	250 Hz	240 Hz	200 Hz
128 Hz	125 Hz	120 Hz	100 Hz

Table 22. Butterworth Filter Input Delay for Available Timebases (f_M)

Timebase (MHz)	Cutoff (Hz)	4th Order		2nd Order	
		Input Delay	Maximum Input Delay	Input Delay	Maximum Input Delay
13.1072	4,096	436.0 µs	457.4 µs	398.7 µs	405.1 µs
	2,048	537.1 µs	580.3 µs	453.3 µs	466.3 µs
	1,024	740.3 µs	827.4 µs	563.1 µs	589.2 µs
	512	1.1465 ms	1.3208 ms	782.9 µs	834.8 µs
	256	1.9583 ms	2.3046 ms	1.2224 ms	1.3263 ms
	128	3.5831 ms	4.2770 ms	2.0825 ms	2.2924 ms
12.8	4.000	446.5 µs	468.3 µs	408.2 µs	414.7 µs
	2.000	549.9 µs	594.2 µs	464.2 µs	477.5 µs
	1.000	758.1 µs	847.2 µs	576.5 µs	603.3 µs
	500	1.1739 ms	1.3524 ms	801.6 µs	854.8 µs
	250	2.0053 ms	2.3598 ms	1.2517 ms	1.3581 ms
	125	3.6691 ms	4.3796 ms	2.1324 ms	2.3474 ms
12.288	3.840	465.0 µs	487.8 µs	425.1 µs	432.0 µs
	1.920	572.8 µs	618.9 µs	483.5 µs	497.3 µs
	960	789.6 µs	882.4 µs	600.5 µs	628.3 µs
	480	1.2228 ms	1.4087 ms	834.9 µs	890.4 µs
	240	2.0888 ms	2.4581 ms	1.3038 ms	1.4146 ms
	120	3.8219 ms	4.5620 ms	2.2212 ms	2.4451 ms
10.24	3.200	557.7 µs	585.0 µs	509.9 µs	518.0 µs
	1,600	687.0 µs	742.4 µs	579.9 µs	596.5 µs

Timebase (MHz)	Cutoff (Hz)	4th Order		2nd Order	
		Input Delay	Maximum Input Delay	Input Delay	Maximum Input Delay
	800	947.2 µs	1.0586 ms	720.3 µs	753.7 µs
	400	1.4671 ms	1.6902 ms	1.0016 ms	1.0682 ms
	200	2.5063 ms	2.9494 ms	1.5643 ms	1.6972 ms
	100	4.5860 ms	5.4741 ms	2.6651 ms	2.9338 ms

Note Input delay is the delay for signal frequencies much lower than the cutoff frequency. Maximum input delay is the peak delay at high signal frequency. The following figures depict how the input delay varies with signal frequency. Refer to the ***FD-11634 User Manual*** for more information.

Figure 8. Butterworth Filter Magnitude Response (4th Order, with 12.8 MHz Timebase)

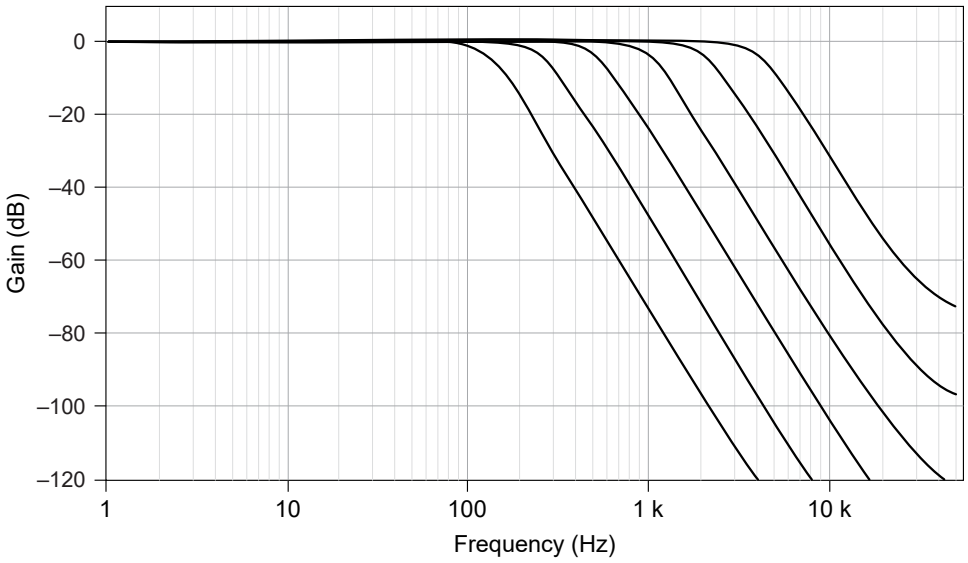


Figure 9. Butterworth Filter Magnitude Response (2nd Order, with 12.8 MHz Timebase)

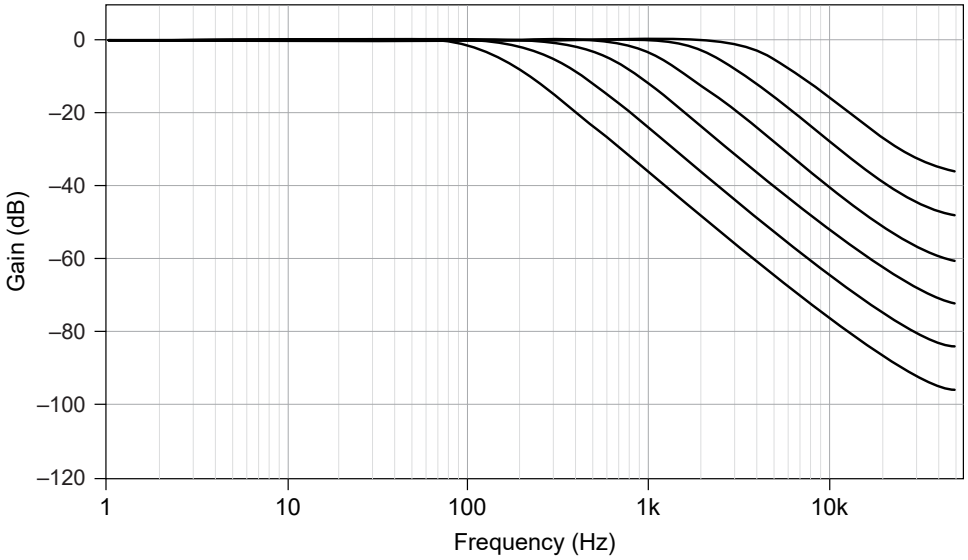


Figure 10. Butterworth Filter Input Delay (4th Order, with 12.8 MHz Timebase, 4 kHz, 2 kHz, 1 kHz Filter)

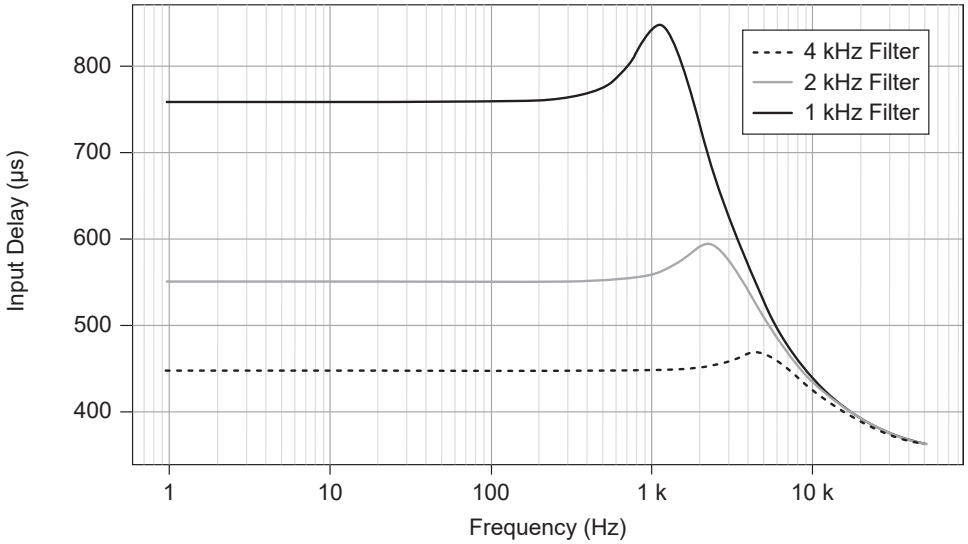


Figure 11. Butterworth Filter Input Delay (4th Order, with 12.8 MHz Timebase, 500 Hz, 250 Hz, 125 Hz

Filter)

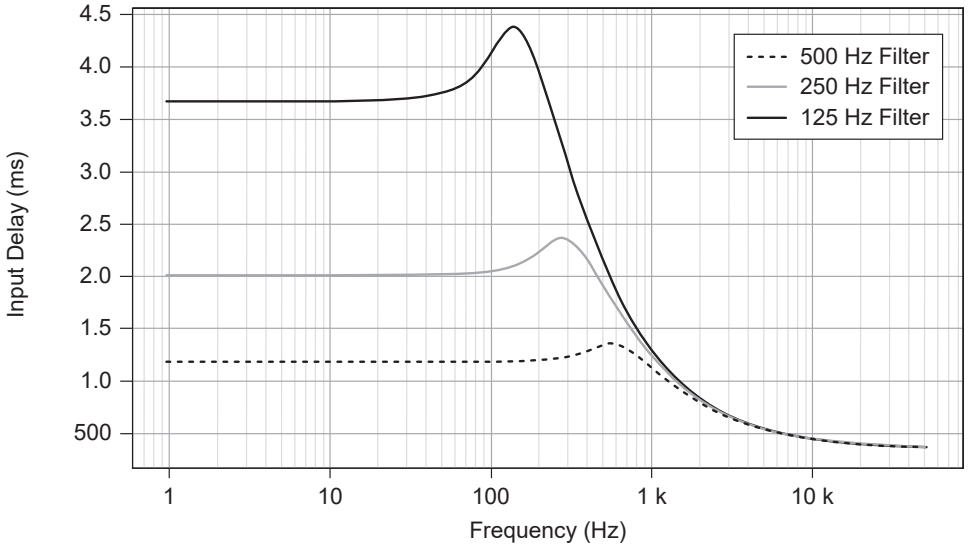


Figure 12. Butterworth Filter Input Delay (2nd Order, with 12.8 MHz Timebase,4 kHz, 2 kHz, 1 kHz Filter)

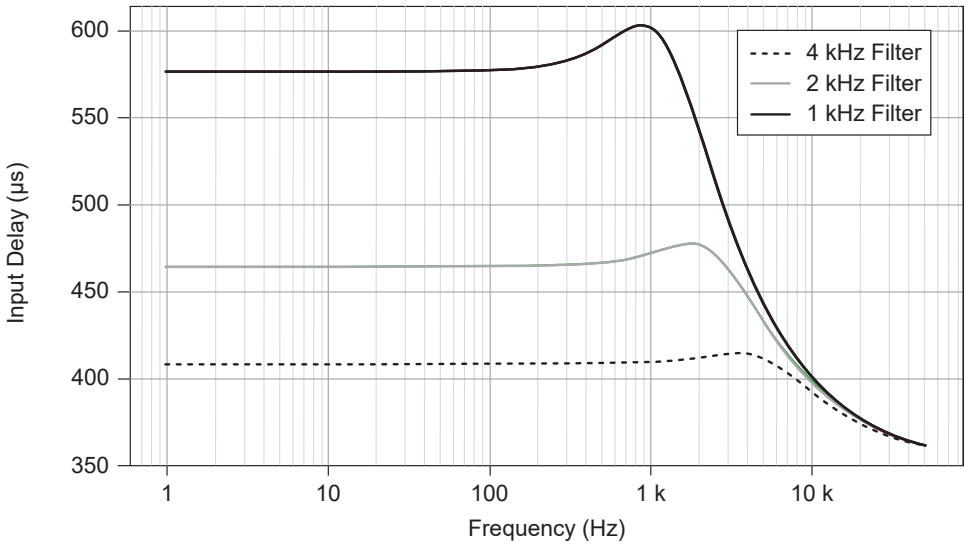
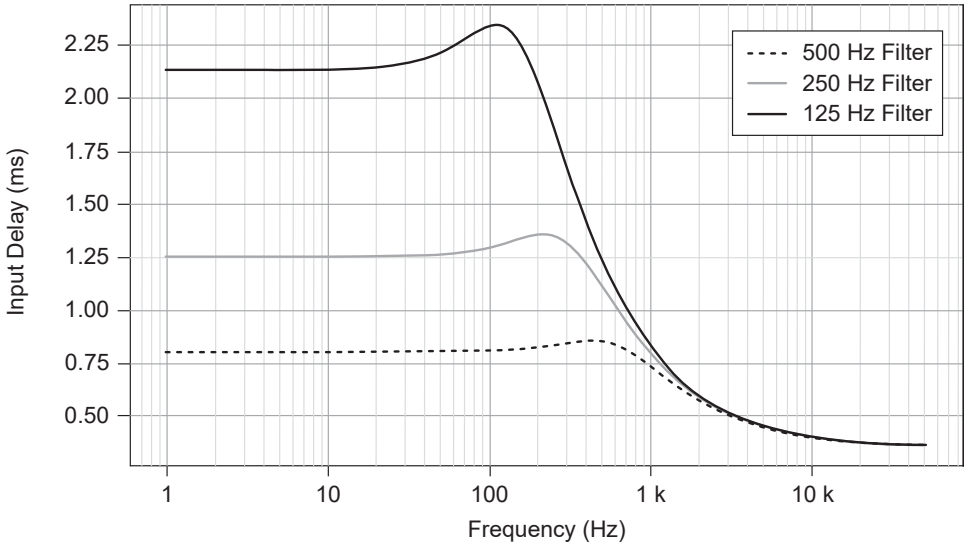


Figure 13. Butterworth Filter Input Delay (2nd Order, with 12.8 MHz Timebase, 500 Hz, 250 Hz, 125 Hz

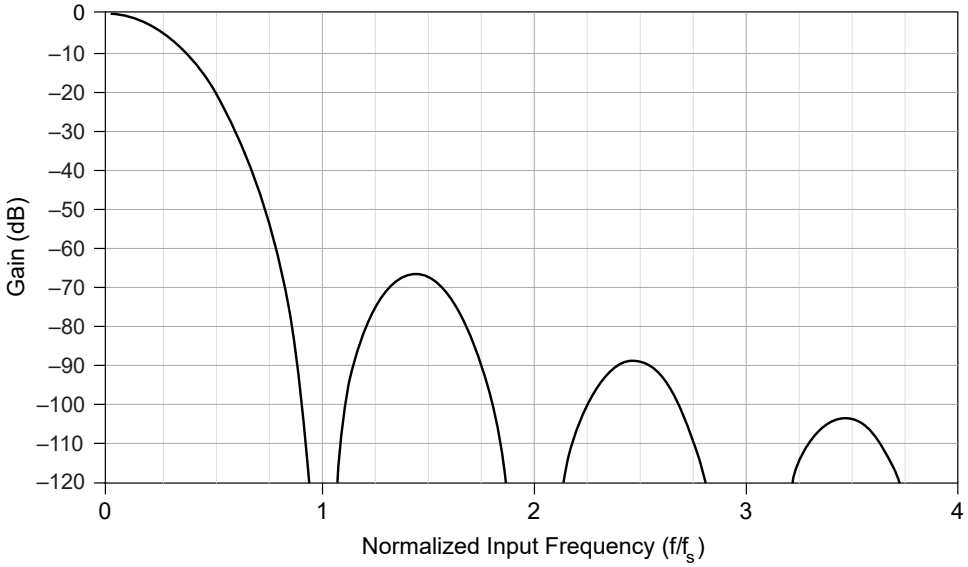
Filter)



Comb Filter

Input delay	$5/f_S + 1.5\ \mu s$
Input delay tolerance	±100 ns
Notches	f_S, 2 f_S, 3 f_S, ...

Figure 14. Comb Filter Magnitude Response



Related information:

- Frequency Response of FieldDAQ Filters

Time-Based Triggers

Type	Start Trigger, Sync Pulse

Timing and Synchronization

Protocol	IEEE 802.1AS for network synchronization over 1000 Base-TX, full-duplex
Network synchronization accuracy[1]	<1 µs
Network synchronization accuracy with optimized configuration[2]	<100 ns

Note When configured to use IEEE 1588, performance of synchronization may vary from these specifications.

For information about network synchronization accuracy, refer to ***NI-DAQmx-Based TSN Synchronization Accuracy Explained***. For information about achieving high-accuracy synchronization, refer to ***How to Achieve High-Accuracy Measurements With NI-DAQmx-Based TSN Devices***.

Related information:

- NI-DAQmx-Based TSN Synchronization Accuracy Explained
- How to Achieve High-Accuracy Measurements With NI-DAQmx-Based TSN Devices

Network Interface

Network protocols	TCP/IP, UDP
Network ports used	HTTP:80 (configuration only), TCP:3580; UDP:5353 (configuration only), TCP:5353 (configuration only); TCP:31415; UDP:7865 (configuration only), UDP:8473 (configuration

1. I/O synchronization is system-dependent. Assumes the devices are connected in a line topology.
2. I/O synchronization is system-dependent. Assumes a system containing one hop.

	only)
Network IP configuration	DHCP + Link-Local, DHCP, Static, Link-Local
Default MTU size	1,500 bytes

Ethernet

Number of ports	2 8-pin X-coded M12 ports, internally switched[3]
Network interface	1000 Base-TX, full-duplex; 1000 Base-TX, half-duplex; 100 Base-TX, full-duplex; 100 Base-TX, half-duplex; 10 Base-T, full-duplex; 10 Base-T, half-duplex
Communication rates	10/100/1,000 Mbps, auto-negotiated
Maximum cabling distance	100 m/segment
Maximum hops per line[4]	15

For information about creating reliable Ethernet-based systems, refer to ***Designing Distributed TSN Ethernet-Based Measurement Systems***.

Related information:

- Designing Distributed TSN Ethernet-Based Measurement Systems

Power Requirements

Table 23. Voltage Input Range

V_{in}	9 V DC to 30 V DC
V_{aux}	Up to 30 V DC

Table 24. Device Power Consumption

Nominal	7.3 W
Maximum	10 W

3. This allows for line topologies or network redundancy.
4. With default software configuration.

- **Device power consumption**—The total amount of power drawn by the device from the power input connector, including power delivered to external sensors.

Current Limits

> **Notice** Exceeding the current limits may cause damage to the device. Stay below a maximum of 10 A shared between both Input and Aux terminals.

Table 25. Power IN/OUT Terminals

V_{in}	10 A maximum
V_{aux}	10 A maximum total (combined with V_{in})

Recommended external overcurrent protection	16 A, slow blow fuse

Physical Characteristics

Table 26. Dimensions and Weight

Dimensions	198.5 mm × 77.4 mm × 47.1 mm (7.8 in. × 3.0 in. × 1.9 in.)
Weight	1.179 kg (2 lb 9.6 oz)

Table 27. Input Connection

Number	8
Type	5-pin A-coded M12 connectors

Torque for M12 connectors (power, Ethernet, input connections)	0.6 N · m (5.31 lb · in.)

Calibration

Calibration interval	1 year

Environmental Characteristics

Refer to the ***FD-11634 User Manual*** for more information about meeting these specifications.

Table 28. Temperature

Operating	-40 °C to 85 °C
Storage	-40 °C to 100 °C

Table 29. Humidity

Operating	Up to 100% relative humidity, condensing or noncondensing
Storage	Up to 100% relative humidity, condensing or noncondensing

Ingress protection	IP65/IP67
Pollution Degree	4
Maximum altitude	5,000 m

Notice Failure to follow the mounting instructions in the ***FD-11634 User Manual*** can cause temperature derating.

Notice To meet shock and vibration specifications in this document, you must panel mount the system.

Notice M12 connectors must be mated to cables or have caps installed on them to meet IP65/IP67 requirements. Cover the unused connectors with the included plastic caps or optional metal caps whenever water, dust, or dirt are present.

Notice Avoid long periods of exposure to sunlight.

Shock and Vibration

Table 30. Operating Vibration

Random	10 g RMS, 5 Hz to 2,000 Hz
Sinusoidal	10 g, 5 Hz to 2,000 Hz
	12.4 mm minimum pk-pk displacement, 5 Hz to 20 Hz

Operating shock	100 g, 11 ms half sine, 3 shocks at 6 orientations, 18 total 40 g, 6 ms half sine, 4,000 shocks at 6 orientations, 24,000 total

Related information:

- FD-11634 User Manual

Environmental Standards

This product meets the requirements of the following environmental standards for electrical equipment.

- IEC 60068-2-1 Cold
- IEC 60068-2-2 Dry heat
- IEC 60068-2-6 Sinusoidal vibration
- IEC 60068-2-27 Shock
- IEC 60068-2-30 Damp heat, cyclic (12 h + 12 h cycle)
- IEC 60068-2-64 Broadband random vibration

Safety Voltages

The FD-11637 is rated for use in DRY or WET LOCATIONS. Do not connect hazardous voltages to the FD-11634. A ***hazardous voltage*** is a voltage greater than 30 V RMS, 42.4 V peak, or 60 V DC in DRY LOCATIONS and 22.6 V peak or 35 V DC in WET LOCATIONS.

Rated Voltages

Connect only voltages that are within the following limits:

Between any two pins	60 V DC (Dry Locations); 35 V DC (Wet Locations)

Temporary Overvoltage Protection

Product has been designed to withstand power frequency overvoltage of relatively long duration as specified below. Voltages beyond these levels may cause permanent damage.

Between any two pins on the connector	±30 V DC

Isolation Voltages

- **Working Voltage**—The highest RMS value of the AC or DC voltage across the insulation that can continuously occur when the equipment is supplied at rated voltage.
- **Transient Overvoltage (Vpk)**—An overvoltage condition of a relatively short duration, a few milliseconds or less, oscillatory or non-oscillatory, usually highly damped.
- **Withstand**—The highest RMS value of AC or DC voltage to which the isolation barrier has been tested in order to verify the insulation can handle the working voltage electrical and mechanical stresses in normal use, verified with a 1 min. duration.

Table 31. Channel-to-Channel Isolation

Working Voltage	60 V DC (Dry Locations); 35 V DC (Wet Locations) Non-Mains
Withstand	1,000 V RMS, verified by 5 s withstand

Table 32. Channel-to-Earth Ground Isolation

Working Voltage	60 V DC (Dry Locations); 35 V DC (Wet Locations) Non-Mains

Withstand	1,000 V RMS, verified by 5 s withstand

These test and measurement circuits are not rated for measurements performed on circuits directly connected to the electrical distribution system referred to as MAINS.

MAINS is a hazardous live electrical supply system to which equipment is designed to be connected to for the purpose of powering equipment. This product is rated for measurements of voltages from specially protected secondary circuits. Such voltage measurements include signal levels, special equipment, limited energy parts of equipment, circuits powered by regulated low-voltage sources, and electronics.

Hazardous Voltage Do not connect the product to signals or use for measurements within Measurement Categories II, III, or IV, or for measurements on MAINs circuits or on circuits derived from Overvoltage Category II, III, or IV which may have transient overvoltages above what the product can withstand. The product must not be connected to circuits that have a maximum voltage above the continuous working voltage, relative to earth or to other channels, or this could damage and defeat the insulation. The product can only withstand transients up to the transient overvoltage rating without breakdown or damage to the insulation. An analysis of the working voltages, loop impedances, temporary overvoltages, and transient overvoltages in the system must be conducted prior to making measurements.

Tension dangereuse Ne pas connecter le produit à des signaux dans les catégories de mesure II, III ou IV et ne pas l'utiliser pour des mesures dans ces catégories, ou des mesures sur secteur ou sur des circuits dérivés de surtensions de catégorie II, III ou IV pouvant présenter des surtensions transitoires supérieures à ce que le produit peut supporter. Le produit ne doit pas être raccordé à des circuits ayant une tension maximale supérieure à la tension de fonctionnement continu, par rapport à la terre ou à d'autres voies, sous peine d'endommager et de compromettre l'isolation. Le produit peut tomber en panne et son isolation risque d'être endommagée si les tensions transitoires dépassent la surtension transitoire nominale. Une analyse des tensions de fonctionnement, des impédances de boucle, des surtensions

temporaires et des surtensions transitoires dans le système doit être effectuée avant de procéder à des mesures.

Safety Compliance Standards

This product is designed to meet the requirements of the following electrical equipment safety standards for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA C22.2 No. 61010-1

Note For safety certifications, refer to the product label or the Product Certifications and Declarations section.

Electromagnetic Compatibility Standards

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326-1 (IEC 61326-1): Class A emissions; Industrial immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- ICES-001: Class A emissions

Note Group 1 equipment is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.

Note In Europe, Australia, New Zealand, and Canada (per CISPR 11) Class A equipment is intended for use in non-residential locations.

Note For EMC declarations and certifications, and additional information, refer to the ***Product Certifications and Declarations*** section.

Notice Operate this product only with shielded cables and accessories.

Notice To ensure the specified EMC performance, operate this product only with shielded Ethernet cables.

Product Certifications and Declarations

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for NI products, visit ni.com/product-certifications, search by model number, and click the appropriate link.