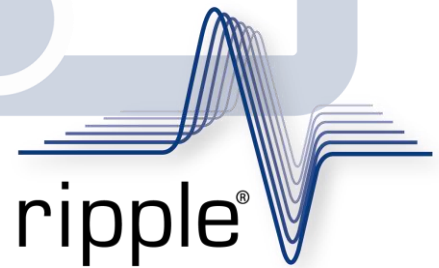




trellis

NEV
Spec



ripple®

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File Format Overview

This document is based on NEV File Format 2.2 only. A sample data file may be downloaded from the [website](#). There are three different file formats used to save analog and digital data acquired using Trellis software:

- The *.NEV files contain information and sampled data for extracellular spikes, stimulation waveforms, and digital input events.
- The *.NSx files contain information and continuously sampled analog data (e.g. local field potentials (LFPs) from the 1-kHz LFP data stream and raw unfiltered 30-kHz analog data from the Raw data stream, as well as Analog I/O input data), digitized in 16-bit signed integer format.
- The *.NFx files contain information and continuously sampled analog data (e.g. electromyograms (EMGs) saved in the 2-kHz Hi-Res data stream), digitized in 32-bit floating point format (IEEE 754 single precision).

Neural recording Front End channels are numbered from 1 to 5120. Stimulation data channel numbers start at 5121 ($512 \times 10 + 1$). Analog I/O input channel numbers start at 10241 ($512 \times 20 + 1$). Digital I/O input events are stored in data packet 0 (see NEV Data Packet section). All data are written in a time increasing manner.

NEV File Format

This data format provides a method for encoding digitized extracellular spikes, stimulation waveforms, and digital input events from up to 512 electrodes (future revisions of the specification will provide higher counts). This format represents a balance between flexibility to encode a variety of different event types, efficiency of encoding, and simplicity of organization for quick analysis.

A *.NEV file is composed of three sections:

- 1) Header Basic Information
A series of fixed-width fields containing information about timebase, authoring application, extended headers, and any user generated comments.
- 2) Header Extended Information
A variable number of fixed-width packets which hold data about the configuration of individual electrode channels and other important experiment information.
- 3) Data Packets
A series of fixed-width packets containing continuous data from individual electrodes.

NEV files consist entirely of packets that contain information about various events. For example, a threshold-crossing on a Front End channel is an event. The event time, spike waveform, and Front End channel number are stored in a data packet. Stimulation waveforms and digital input events are also stored similarly in data packets. Note: Digital output events can be captured in NEV data packets by “echoing” outputs to input channels (see Grapevine User Manual).



NEV Basic Header

This is the first section in the NEV file. It contains one header with the following fields (in the order listed). All multi-byte data types are stored in little-endian format.

NEURALEV

Field	Type	Length (Bytes)	Description
File Type ID	Char array	8	Always set to “NEURALEV” for “neural events”.
File Spec	2x unsigned char	2	The major and minor revision numbers of the file specification used to create the file e.g. use 0x0202 for NEV Spec. 2.2.
Additional Flags	Unsigned int-16	2	File format additional flags. Bit 0: Set if all spike waveform values in the file are 16-bit; un-set if a mixture is to be expected. In the un-set case you MUST look at NEUEVWAV to determine the number of bytes per waveform sample. All other bits are reserved and should be set to 0.
Bytes in Headers	Unsigned int-32	4	The total number of bytes in both headers (Standard and Extended). This value can also be considered to be a zero-indexed pointer to the first data packet.
Bytes in Data Packets	Unsigned int-32	4	The length (in bytes) of the fixed width data packets in the data section of the file. The packet sizes must be between 12 and 256 bytes (see Data Section description). Packet sizes are required to be multiples of 4 so that the packets are aligned for 32-bit file access. Referred to as Packet_width in Nev Data Packets section.
Time Resolution of Time Stamps	Unsigned int-32	4	This value denotes the frequency (counts per second) of the clock used to specify sample time.
Time Resolution of Samples	Unsigned int-32	4	This value denotes the sampling frequency (samples per second) used to digitize neural waveforms.
Time Origin	Windows SYSTEM TIME structure	16	The Coordinated Universal Time (UTC) at which the data in the file were collected. This also corresponds to time index zero for the time stamps in the file. The structure consists of eight 2-byte unsigned int-16 values defining the Year, Month, DayOfWeek, Day, Hour, Minute, Second, and Millisecond.
Application to Create File	String – Char array	32	A 32-character string labeling the program which created the file. Trellis will also include its revision number in this label. The string must be null terminated.
Comment Field	String – Char array	200	A 200-character, null-terminated string used for embedding user comments into the data field. Multi-line comments should ideally use no more than 80 characters per line and no more than 8 lines. The string must be NULL terminated.
Reserved		52	Reserved for future information (written as 0).
Processor Timestamp	Unsigned int-32	4	The processor timestamp (in 30 kHz clock cycles) at which the data in the file were collected.



# of Extended Headers	Unsigned int-32	4	A long value indicating the number of extended header entries.
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NEV Extended Headers

This section of the NEV file contains a variable number of 32-byte, fixed-length headers. The exact number of headers in this section is specified at the end of the Basic Header section (see above). These headers may be used to include additional configuration information and comments into the file.

Each 32-byte header consists of an **8 byte identifier** and a **24 byte information field**. These headers are not required to be of any registered type. For example, a program can add extended headers to the NEV file that only the program or related programs can utilize. However, there are several standard entries and identifiers that are defined in the specification and listed below with the 8 character identifier and 24 byte information field.

Note: For NEUEVWAV headers, the Stim Amp Digitization Factor is set to 0 for neural waveforms, and the Neural Amp Digitization Factor is set to 0 for stimulation waveforms. Stimulation channels have associated NEUEVWAV and NEUEVLBL headers but not NEUEVFLT headers.

NEUEVWAV

Field	Type	Length (Bytes)	Description
Packet ID	Char array	8	Always set to “NEUEVWAV” for a standard “neural event waveform”.
Electrode ID	Unsigned int-16	2	Electrode ID number used in the data section of the file. Recording electrodes start at 1 and Stimulation electrodes start at 5121. Also used in NEUEVFLT and NEUEVLBL.
Front End ID	Unsigned char	1	Front end ID is based on connection to the neural processor (numbered 1–16). Front ends connected to port A are numbered 1–4, port B are numbered 5–8, port C are numbered 9–12, and port D are numbered 13–16.
Front End Connector Pin	Unsigned char	1	Front end connector pin attached to an electrode or input channel (e.g. pins 1–32 on front ends 1–16).
Neural Amp Digitization Factor	Unsigned int-16	2	Neural Waveform Digitization factor (nV per LSB step). (if 0, use Stim Amp Digitization Factor below)
Energy Threshold	Unsigned int-16	2	Energy threshold, 0 if none used.
High Threshold	Int-16	2	Amplitude of high threshold used (in μV), 0 to 32767.
Low Threshold	Int-16	2	Amplitude of low threshold used (in μV), 0 to -32767 .
Number of Sorted Units	Unsigned char	1	Number of sorted units for the electrode, set to 0 for no unit classification.
Bytes per Sample	Unsigned char	1	Number of bytes per waveform sample, a value of 0 or 1 indicates 1 byte; 2 indicates 2 bytes; 3 indicates 3 bytes; etc.



Stim Amp Digitization Factor	Float-32	4	Stimulation Waveform Digitization factor (V per LSB step). (if 0, use Neural Amp Digitization Factor above)
		6	Remaining bytes reserved, write as zero.

NEUEVFLT

Field	Type	Length (Bytes)	Description
Packet ID	Char array	8	Always set to “NEUEVFLT” for a standard “Neural Event Filter”.
Electrode ID	Unsigned int-16	2	Electrode ID number used in the data section of the file. Also used in NEUEVWAV and NEUEVLBL. Note: Stimulation electrodes do not contain NEUEVFLT headers.
High Pass Corner Frequency	Unsigned int-32	4	High pass filter corner frequency in mHz.
High Pass Filter Order	Unsigned int-32	4	High pass filter order. 0 = NONE
High Pass Filter Type	Unsigned int-16	2	High pass filter type: 0 = None, 1 = Butterworth, 2 = Chebyshev
Low Pass Corner Frequency	Unsigned int-32	4	Low pass filter corner frequency in mHz.
Low Pass Filter Order	Unsigned int-32	4	Low pass filter order. 0 = NONE
Low Pass Filter Type	Unsigned int-16	2	Low pass filter type: 0 = None, 1 = Butterworth, 2 = Chebyshev
		2	Remaining bytes reserved, write as zero.

NEUEVLBL

Field	Type	Length (Bytes)	Description
Packet ID	Char array	8	Always set to “NEUEVLBL” for a standard “Neural Event Label”
Electrode ID	Unsigned int-16	2	Electrode ID number used in the data section of the file. Recording electrodes start at 1 and Stimulation electrodes start at 5121. Also used in NEUEVWAV & NEUEVFLT
Label	String – Char array	16	Label or name of the electrode (e.g. “elec1”). Must be NULL terminated.
		6	Remaining bytes reserved, write as zero.

DIGLABEL (used only if Digital Front End is present)

Field	Type	Length (Bytes)	Description
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Packet ID	Char array	8	Always set to “ DIGLABEL ” for a standard “Digital Label”
Label	String – Char array	16	Label of the digital channel. Must be NULL terminated
Mode	Byte	1	0 = serial, 1 = parallel
		7	Remaining bytes reserved, write as zero.

NEV Data Packets

This section of the NEV file contains an open-ended number of fixed-length data packets. Extracellular spike events, stimulation waveforms, and digital input events are stored in these packets. Each packet begins with a **4-byte Timestamp** and a **2-byte Packet Identifier**. The remaining bytes of the packet are defined according to the Packet ID.

Packet Identifier 0

Represents packets that contain digital input data. These packets can be inserted whenever a periodic sampling timer expires, the value of a digital input port changes, or a digital strobe is triggered. An event on any digital input will generate a data packet containing the state of all Digital I/O Front End inputs.

The data fields of packets with Packet ID 0 are (in order):

Field	Type	Length (Bytes)	Description
Timestamp	Unsigned int-32	4	Time at which event occurred. A time stamp of zero corresponds to the beginning of the data acquisition cycle. The frequency of the time stamp clock and the time of the file creation are stored in the file header.
Packet ID	Unsigned int-16	2	Equal to zero.
Packet Insertion Reason	Unsigned char	1	Bit flag field detailing why this packet was inserted: bit 0 set if there is a change to any bit of the digital input parallel port or strobe is triggered. bit 1 set if digital SMA input channel 1 changes bit 2 set if digital SMA input channel 2 changes bit 3 set if digital SMA input channel 3 changes bit 4 set if digital SMA input channel 4 changes bit 5 (not used) bit 6 set if periodic sampling event bit 7 set if serial channel changed (bit 0 must be set as well) Note: multiple bits may be set
Reserved	Unsigned char	1	Reserved for future unit information (use 0).
Parallel Input	Unsigned int-16	2	Value of digital input parallel port.
SMA Input 1	Int-16	2	Value of digital SMA input channel 1.
SMA Input 2	Int-16	2	Value of digital SMA input channel 2.
SMA Input 3	Int-16	2	Value of digital SMA input channel 3.
SMA Input 4	Int-16	2	Value of digital SMA input channel 4.



Reserved	char	Packet_ width-18	Remaining bytes reserved, write as zero.
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Packet Identifiers 1 through 512

Represents a spike event on the electrode number given by the Packet ID number. For example, a data packet with ID 25 corresponds to a spike on channel 25. Note: The Timestamp associated with each spike event is the beginning of the 52 sample spike window (15 samples prior to threshold crossing), not the threshold-crossing event itself. Note: Spike events occurring faster than every 1.7 ms will not be completely captured as spike event data packets do not overlap. The data fields of spike packets are (in order):

Field	Type	Length (Bytes)	Description
Timestamp	Unsigned int-32	4	Time at which event occurred. A time stamp of zero corresponds to the beginning of the data acquisition cycle. The frequency of the time stamp clock and the time of the file creation are stored in the file header.
Packet ID	Unsigned int-16	2	Electrode ID number (1–512). (same as NEUEVWAV, NEUEVFLT, and NEUEVLBL)
Unit Classification Number	Unsigned char	1	Unit classification number for the spike event: 0 = unclassified 1–16 = units 1 through 16 17–254 = reserved 255 = “noise”
Reserved	Unsigned char	1	Reserved for future unit information (use 0).
Waveform	Integer array	Packet_width – 8	The sampled spike waveform. Sample size is defined in the NEUEVWAV extended header (“Bytes per Sample”).

Packet Identifiers 5121 through 5632

Represents a stimulation waveform on the electrode number given by the Packet ID number. For example, a data packet with ID 5145 indicates that a stimulation waveform was delivered on channel 25 (5145 – 5120 = 25). Stimulation data is acquired in continuous 52 sample packets for each stimulation pulse, from the time when the stimulation pulse starts until the end of the monophasic or biphasic stimulation waveform. A single stimulation pulse may span multiple data packets if long pulsewidths are used, and a single data packet may contain multiple stimulation pulses if very high frequency stimulation is used. The data fields of stimulation waveform packets are (in order):

Field	Type	Length (Bytes)	Description
Timestamp	Unsigned int-32	4	Time at which event occurred. A time stamp of zero corresponds to the beginning of the data acquisition cycle. The frequency of the time stamp clock and the time of the file creation are stored in the file header.
Packet ID	Unsigned int-16	2	Electrode ID number (5121–5632). (same as NEUEVWAV and NEUEVLBL).
Reserved	Unsigned char	2	Reserved for future information (use 0).



Waveform	Integer array	Packet_ width – 8	The sampled stimulation waveform. Sample size is defined in the NEUEVWAV extended header (“Bytes per Sample”).
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Continuation Packets

If the time stamp of the packet is 0xFFFFFFFF, the remaining bytes of the packet are a continuation of the previous packet and should be appended to that packet. This is to provide support for future revisions in which the packet size may be allowed to shrink to 8 characters wide (no event waveform storage). In this case, the continuation packets would be used to squeeze packets which would not fit into an 8 character wide format.



NSx File Format

In addition to the .NEV format described above, there can also be .NSx continuous analog data files. These files have the extension .NSx where x is some number between 1 and 9. This file type is used to store information and data for channels which are sampled continuously (e.g., raw or LFP data). All data are written in a time non-decreasing manner in 16-bit signed integer format. A file with the extension .NSx will often be accompanied by a .NEV file with the same base name: for instance, data.nev and data.ns2. The existence of a single extended NSx file does not require or preclude the existence of other NSx files. Moreover, the NSx files will not necessarily start with .ns1; the combination of data.nev and data.ns2 is perfectly valid. The existence of two NSx files indicates that continuous channel sampling occurred at two data rates; e.g, 500 S/s (*.ns1) and 1 kS/s (*.ns2).

NSx Basic Header

The NSx file begins with a single header. Note: char arrays are **not** guaranteed to be 0 (null) terminated. However, they will be null terminated if the string is shorter than the maximum length allowed. All multi-byte data types are stored in little-endian format.

NEURALCD

Field	Type	Length (Bytes)	Description
File Type ID	Char array	8	Always set to “ NEURALCD ” for “Neural Continuous Data”.
File Spec	2x unsigned char	2	The major and minor revision numbers of the file specification used to create the file e.g. use 0x0202 for NEV Spec. 2.2.
Bytes in Headers	Unsigned int-32	4	The total number of bytes in all headers (Standard and Extended). This value can also be considered to be a zero-indexed pointer to the first data packet.
Label	Char array	16	Label specifying the type of data acquired (e.g., “1 kS/s” or “LFP”). Must be '0' terminated.
Comments	Char array	200	A 200-character, null-terminated user comment string.
Application to Create File	Char array	52	A 52-character string labeling the program which created the file. Trellis will also include its revision number in this label.
Processor Timestamp	Unsigned int-32	4	The processor timestamp (in 30 kHz clock cycles) at which the data in the file were collected.
Period	Unsigned int-32	4	Number of 1/30,000 second intervals between data points e.g. sampling rate of 30 kS/s = 1; 1 kS/s = 30
Time Resolution of Time Stamps	Unsigned int-32	4	This value denotes the frequency (counts per second) of the clock used to specify sample time.



Time Origin	Windows SYSTEM TIME structure	16	The Coordinated Universal Time (UTC) at which the data in the file was collected. This also corresponds to time index zero for the time stamps in the file. The structure consists of eight 2-byte unsigned int-16 values defining the Year, Month, DayOfWeek, Day, Hour, Minute, Second, and Millisecond.
Channel Count	Unsigned int-32	4	Number of channels per data point. This will also match the number of extended headers.

NSx Extended Headers

The number of headers in this section is specified by the Channel Count in the NEURALCD header. These headers are used to indicate which channels were recorded and what their configuration was. Additional extended headers, such as comments, may be added in the future.

CC

Field	Type	Length (Bytes)	Description
Type	Char array	2	Always set to “CC” for “Continuous Channels”
Electrode ID	Unsigned int-16	2	ID of electrode being sampled. This field is the same as the Electrode ID field of the NEV file. Recording electrodes start at 1 and analog data channels start at 10241.
Electrode label	String – Char array	16	Label or name of the electrode (e.g. “elec1”). Must be NULL terminated.
Front End ID	Unsigned char	1	Front end ID is based on connection to the neural processor (numbered 0–15). Front ends connected to port A are numbered 0–3, port B are numbered 4–7, port C are numbered 8–11, and port D are numbered 12–15.
Front End Connector Pin	Unsigned char	1	Front end connector pin attached to an electrode or input channel (e.g. pins 1-32 on front ends 1-16).
Min Digital Value	Int-16	2	Minimum digital value of the signal (e.g. –8192).
Max Digital Value	Int-16	2	Maximum digital value of the signal (e.g. 8192).
Min Analog Value	Int-16	2	Minimum analog value of the signal (e.g. –5000 mV).
Max Analog Value	Int-16	2	Maximum analog value of the signal (e.g. 5000 mV).
Units	String – Char array	16	Units of the analog min/max values (“mV”, “µV”). Must be NULL terminated
High Pass Corner Frequency	Unsigned int-32	4	High pass filter corner frequency in mHz.
High Pass Filter Order	Unsigned int-32	4	High pass filter order. 0 = NONE
High Pass Filter Type	Unsigned int-16	2	High pass filter type: 0 = None, 1 = Butterworth, 2 = Chebyshev



Low Pass Corner Frequency	Unsigned int-32	4	Low pass filter corner frequency in mHz.
Low Pass Filter Order	Unsigned int-32	4	Low pass filter order. 0 = NONE
Low Pass Filter Type	Unsigned int-16	2	Low pass filter type: 0 = None, 1 = Butterworth, 2 = Chebyshev

Immediately following the header will be the “data” section.

NSx Data Packets

This section of the NSx file contains an open-ended number of packets consisting of a header, a timestamp, the total number of sampled data points, and a variable number of data points.

The timestamp reported in each data packet indicates the sampling time for the first data point stored in that packet. If a pause occurs during data storage (see Grapevine User Manual), a new data packet will be created when data storage resumes at the end of the pause. The timestamp field is followed by a field specifying the number of data points stored in the packet. Data points correspond to a single point in time and the data points are in order of increasing time. Each data point consist of samples from one or more channels (see Diagram below table).

0x01

Field	Type	Length (Bytes)	Description
Header	Byte	1	Always set to 0x01.
Timestamp	Unsigned int-32	4	A time stamp of zero corresponds to the beginning of the data acquisition cycle. The frequency of the time stamp clock and the time of the file creation are stored in the file header.
Number of Data Points	Unsigned int-32	4	Number of data points following this header.
Data Point	Array of int-16	Variable (2 bytes per channel)	This corresponds to a single data collection point. There will be exactly “Channel Count” number of values per data point. They will be sorted in the same order as they are presented in “Channel ID”. Data will be stored as digital values.

NSx Data Packet Diagram



NF_x File Format

In addition to the .NEV and .NS_x format described above, there can also be .NF_x continuous analog data files. These files have the extension .NF_x where x is some number between 1 and 9. This file type is used to store information and data for channels which are sampled continuously (e.g., Hi-Res data for EMG). All data are written in a time non-decreasing manner in 32-bit floating point format (IEEE 754 single precision). A file with the extension .NF_x will often be accompanied by a .NEV file with the same base name: for instance, data.nev and data.nf2. Note: The existence of a single extended NF_x file does not require or preclude the existence of other NF_x files. Moreover, the NF_x files will not necessarily start with .nf1; the combination of data.nev and data.nf2 is perfectly valid.

NF_x Basic Header

The NF_x file begins with a single header. Note: char arrays are **not** guaranteed to be 0 (null) terminated. However, they will be null terminated if the string is shorter than the maximum length allowed. All multi-byte data types are stored in little-endian format.

NEUCDFLT

Field	Type	Length (Bytes)	Description
File Type ID	Char array	8	Always set to “NEUCDFLT” for “Neural Continuous Data Float”.
File Spec	2x unsigned char	2	The major and minor revision numbers of the file specification used to create the file e.g. use 0x0202 for NEV Spec. 2.2.
Bytes in Headers	Unsigned int-32	4	The total number of bytes in all headers (Standard and Extended). This value can also be considered to be a zero-indexed pointer to the first data packet.
Label	Char array	16	Label specifying the type of data acquired (e.g., “2 kS/s” or “Hi-Res”). Must be '0' terminated.
Comments	Char array	200	A 200-character, null-terminated user comment string.
Application to Create File	Char array	52	A 52-character string labeling the program which created the file. Trellis will also include its revision number in this label.
Processor Timestamp	Unsigned int-32	4	The processor timestamp (in 30 kHz clock cycles) at which the data in the file were collected.
Period	Unsigned int-32	4	Number of 1/30,000 second intervals between data points e.g. sampling rate of 30 kS/s = 1; 1 kS/s = 30
Time Resolution of Time Stamps	Unsigned int-32	4	This value denotes the frequency (counts per second) of the clock used to specify sample time.



Time Origin	Windows SYSTEM TIME structure	16	The Coordinated Universal Time (UTC) at which the data in the file was collected. This also corresponds to time index zero for the time stamps in the file. The structure consists of eight 2-byte unsigned int-16 values defining the Year, Month, DayOfWeek, Day, Hour, Minute, Second, and Millisecond.
Channel Count	Unsigned int-32	4	Number of channels per data point. This will also match the number of extended headers.

NFx Extended Headers

The number of headers in this section is specified by the Channel Count in the NEUCDFLT header. These headers are used to indicate which channels were recorded and what their configuration was. Additional extended headers, such as comments, may be added in the future.

FC

Field	Type	Length (Bytes)	Description
Type	Char array	2	Always set to “FC” for “Float Channels”
Electrode ID	Unsigned int-16	2	ID of electrode being sampled. This field is the same as the Electrode ID field of the NEV file. Recording electrodes start at 1 and analog data channels start at 10241.
Electrode label	String – Char array	16	Label or name of the electrode (e.g. “elec1”). Must be NULL terminated.
Front End ID	Unsigned char	1	Front end ID is based on connection to the neural processor (numbered 0–15). Front ends connected to port A are numbered 0–3, port B are numbered 4–7, port C are numbered 8–11, and port D are numbered 12–15.
Front End Connector Pin	Unsigned char	1	Front end connector pin attached to an electrode or input channel (e.g. pins 1-32 on front ends 1-16).
Min Digital Value	Int-16	2	Minimum digital value of the signal (e.g. –8192).
Max Digital Value	Int-16	2	Maximum digital value of the signal (e.g. 8192).
Min Analog Value	Int-16	2	Minimum analog value of the signal (e.g. –5000 mV).
Max Analog Value	Int-16	2	Maximum analog value of the signal (e.g. 5000 mV).
Units	String – Char array	16	Units of the analog min/max values (“mV”, “μV”). Must be NULL terminated
High Pass Corner Frequency	Unsigned int-32	4	High pass filter corner frequency in mHz.
High Pass Filter Order	Unsigned int-32	4	High pass filter order. 0 = NONE
High Pass Filter Type	Unsigned int-16	2	High pass filter type: 0 = None, 1 = Butterworth, 2 = Chebyshev



Low Pass Corner Frequency	Unsigned int-32	4	Low pass filter corner frequency in mHz.
Low Pass Filter Order	Unsigned int-32	4	Low pass filter order. 0 = NONE
Low Pass Filter Type	Unsigned int-16	2	Low pass filter type: 0 = None, 1 = Butterworth, 2 = Chebyshev

Immediately following the header will be the “data” section.

NFx Data Packets

This section of the NFx file contains an open-ended number of packets consisting of a header, a timestamp, the total number of sampled data points, and an array of sampled data values.

The timestamp reported in each data packet indicates the sampling time for the first data point stored in that packet. If a pause occurs during data storage (see Grapevine User Manual), a new data packet will be created when data storage resumes at the end of the pause. The timestamp field is followed by a field specifying the number of data points stored in the packet. Data points correspond to a single point in time and the data points are in order of increasing time. Each data point consist of samples from one or more channels (see NSx Data Packet Diagram).

0x01

Field	Type	Length (Bytes)	Description
Header	Byte	1	Always set to 0x01.
Timestamp	Unsigned int-32	4	A time stamp of zero corresponds to the beginning of the data acquisition cycle. The frequency of the time stamp clock and the time of the file creation are stored in the file header.
Number of Data Points	Unsigned int-32	4	Number of data points following this header.
Data Point	Array of float-32	Variable (4 bytes per channel)	This corresponds to a single data collection point. There will be exactly “Channel Count” number of values per data point. They will be sorted in the same order as they are presented in “Channel ID”. Data will be stored as digital values.



Revision History

- Version 01
 - Initial release
- Version 02
 - Time Origin Description fixed to “Coordinated Universal Time (UTC)”, not Local Time.
 - Sample data file location added.
- Version 03
 - Processor timestamp for start of file included in NEV-NEURALEV, NSX-NEURALCD, and NFX-NEUCDFLT headers.
 - Addition of the NEV- NEUEVLBL header
- Version 04
 - Updated NEUEVLBL, NEUEVFLT, and NEUEVWAV headers for correct data stream information.
 - Updated size of Comments section in NEURALEV, NEURALCD, and NEUCDFLT headers.
- Version 05
 - Updated location for saved demo data file
- Version 06
 - Updated link to demo data
- Version 07
 - Correction to Reserved field in NEV data packets with Packet ID 0: Type is char, Length is Packet_width – 8.
 - Correction to Front End ID indexing in NSx and Nfx extended headers: Front Ends are zero-indexed and range from ID 0 to 15.
 - Correction to Waveform field in NEV data packets with Packet IDs 1–512 and 5121–5632: Type is integer array and Description includes additional text about sample size.
 - Correction to Packet ID field in NEV data packets with Packet IDs 5121–5632: Description field gives range of values as 5121–5632 not 5121–5145.