



INTRODUCTION

TCNet is originally designed by developers from the entertainment industry to create an open communication protocol between devices or software to share real-time Time Code and Meta Data. The protocol is open and free to be used and everyone can contribute.

COMMUNICATION VIA NODES

TCNet is designed to have virtually unlimited amount of nodes that can participate. Each node is identified by its own unique MAC address and can have one of three roles: Auto, Master, Slave or Repeater. For example: A Master generates TCNet Time Code packets and sends these to all Slaves in network, A Slave only receives TCNet Metadata and Timing packets. A Repeater is capable of receiving AND sending TCNet Metadata and Timing Packets. No matter what role a node is, it is capable to send and receive TCNet Control Message packets.

TCNet Opt-IN packets are sent by a node, every 1000 milliseconds to establish and keep participation in a TCNet network.

Each node finds and populates other nodes this way and holds a active population list of all nodes and its functions, listener port and timer.

When a node disconnects or disappears from a TCNet network, it should be automatically deleted from the population list.

NETWORK PORTS

TCNet communicates via the UDP protocol. The following ports are used:

Broadcast ports:

60000 - Used for Opt-IN and Opt-OUT messages

60000 - Used for Application Specific Data (Non public data shared between applications)

60001 - Used for broadcasting TCNet Time Packets

Unicast ports:

65023-65535 - Used for unicast messages. (Default is 65023)

NETWORK PARTICIPATION

To join a TCNet network the following steps need to be taken:

First step:

Create an internal timer that runs from 0-999999 Microseconds (This can also be done by using computers internal clock and take Microseconds of each second cycle)

Second step:

Open a listener on port 60000,60001,60002 to receive TCNet broadcast packets.

Third step:

Send a TCNet GW Opt-IN package every 1000 milliseconds, containing basic information and functionality of the node. (See: OPT-IN/OPT-OUT MESSAGES)

Fourth step:

Wait for incoming Opt-IN messages and keep track of all nodes in a list. Each Node tells what port to use to communicate.

Additional step:

Perform a time sync between all discovered nodes. (See: SYNC MESSAGES)

After joining a TCNet network, depending on your node's role, you can send and receive information.

The basic rule is that only a Master or Repeater can send data and that a Slave or Repeater only can request data.



OPT-IN/OPT-OUT MESSAGES

The following Opt-In/Opt-Out message types are defined in this document:

- 002 – TCNet OPT-IN Packet (Broadcast on port 60000)
- 003 – TCNet OPT-OUT Packet (Broadcast on port 60000)

STATUS MESSAGES

Broadcast of Realtime Status messages:

- 005 – TCNet Status Packet (Broadcast on port 60000)

SYNC MESSAGES

The following Sync message types are defined in this document:

- 010 – TCNet Time Sync Packet (Unicast on port Target-Node-Port)

NOTIFICATION MESSAGES

Control messages are special messages that allow remote control TCNet nodes. (Full documentation upon request)
The following control message types are defined in this document:

- 013 – TCNet Error Notification Packet (Unicast on port Target-Node-Port)
- 020 – TCNet Request Packet (Unicast on port Target-Node-Port)
- 030 – TCNet Application Specific Data Packet (Broadcast on port 60001, Unicast on Target-Node-Port)

CONTROL MESSAGES

Control messages are special messages that allow remote control TCNet nodes. (Full documentation upon request)
The following control message types are defined in this document:

- 101 – TCNet Control Messages (Unicast on port Target-Node-Port)
- 128 – TCNet Text Data (Broadcast on port 60000 or Unicast on port Target-Node-Port)
- 132 – TCNet Keyboard Data (Broadcast on port 60000 or Unicast on port Target-Node-Port)

DATA PACKETS

Data message types are messages containing data such as metadata, timing data, waveform data, cues etc.
The following data message types are defined in this document:

- 200 - TCNet Data Packet - Metrics Data (Unicast on port Target-Node-Port) (Type 2)
- 200 - TCNet Data Packet - Metadata (Unicast on port Target-Node-Port) (Type 4)
- 200 - TCNet Data Packet - Beat Grid Info (Unicast on port Target-Node-Port) (Type 8)
- 200 - TCNet Data Packet - Cue Data Info (Unicast on port Target-Node-Port) (Type 12)
- 200 - TCNet Data Packet - Small Wave Form (Unicast on port Target-Node-Port) (Type 16)
- 200 - TCNet Data Packet - Big Wave Form (Unicast on port Target-Node-Port) (Type 32)

FILE PACKETS

File packet types are packets containing data such as images and audio files.
The following data message types are defined in this document:

- 204 - TCNet Data File Packet – Low Res Artwork Image (Unicast on port Target-Node-Port) (Type 128)

APPLICATION SPECIFIC DATA PACKETS

Application Specific Data packet types are packets containing data exchanged between applications.
The following data message types are defined in this document:

- 213 - TCNet Application Specific Data (Broadcast on port 60000, Unicast on Target-Node-Port)

TIMING PACKETS

Time Packets are time critical and updated at high rates.

- 254 - TCNet Time Packet (Broadcast on port 60001, Unicast on Target-Node-Port)

NODE OPTIONS

When a node opts in on a TCNet network, the communication flags can be set in this byte. If you need to set more flags than one, just sum the flags (Flag 1+ Flag 2+ Flag 8 = 11)
The following flags are available:

- 1 – NEED AUTHENTICATION (Authentication for extended communication needed)
- 2 – SUPPORTS TCNCM (Listens to TCNet Control Messages)
- 4 – SUPPORTS TCNASDP (Listens to TCNet Application Specific Data Packet)
- 8 – DND (Do not disturb/Sleeping. Node will request data itself if needed to avoid traffic)



FLAME VERSIONS

To make sure TCNet is backwards compatible, a flame number is used for each addition or change. To make your applications backwards compatible with older versions, always check for the protocol version of incoming packets.

INFORMATION

For more background information or documentation, please don't hesitate to make inquiries to dev@eiglive.com.

TCNet Opt-IN Packet

Functionality	Present and keep alive a node into a TCNet network.
Type	Broadcast
Port	UDP(60000)
Size	68
Behavior	Broadcast every 1000ms

PARAMETERS	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	6	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	2	Type 2: TCNet OPT-IN	V1-0
Node Name	8	8	ASCII TEXT*	Node Name	V3-1
SEQ	16	1	0-255	Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
Data					
Node Count	24	2	0-65535 (LITTLE ENDIAN)	Amount of Registered Nodes	V3-1
Node Listener Port	26	2	65023-65535 (LITTLE ENDIAN)	Listener Port for Unicast Messages	V3-1
Uptime	28	2	0-43199 (LITTLE ENDIAN)	Uptime of Node in SEC	V3-2
RESERVED	30	2		RESERVED	V3-2
Vendor Name	32	16	ASCII TEXT	Vendor	V3-2
Application/Device Name	48	16	ASCII TEXT	Application / Device Name	V3-2
Application/Device Major Version	64	1	0-255	Application/Device Major Version	V3-2
Application/Device Minor Version	65	1	0-255	Application/Device Minor Version	V3-2
Application/Device Bug Version	66	1	0-255	Application/Device Minor Version	V3-2
RESERVED	67	1		RESERVED	V3-2

* See details below:

TCNet Opt-IN Packet – Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet. - Value=2
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Time stamp in microseconds that is used to calculate network latency.
Node Count	Number of nodes registered by system
Node Listener Port	Listener port of node (Used to receive unicast messages)
Uptime	Up time of Node in seconds. (!) Must Roll over / Reset every 12 hours.
Vendor Name	Name of Vendor of Node
Application/Device Name	Name of Application/Device (Node)
Major Version	Major Version of Node
Minor Version	Minor Version of Node
Bug Version	Bug Version of Node

TCNet Opt-OUT Packet

Functionality	Notifies other nodes that node leaves network.
Type	Broadcast
Port	UDP(60000)
Size	26
Behavior	Broadcast once when leaving network

PARAMETERS	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	1	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	3	Type 3: TCNet OPT-OUT	V1-0
Node Name	8	8	ASCII TEXT*	Node Name	V3-1
SEQ	16	1	0-255	Sequence Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
Data					
Node Count	24	2	0-65535 (LITTLE ENDIAN)	Amount of Registered Nodes	V3-1
Node Listener Port	26	2	65023-65535 (LITTLE ENDIAN)	Listener Port for Unicast Messages	V3-1

* See details below:

TCNet Opt-OUT Packet - Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet. Value=3
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Timestamp in microseconds that is used to calculate network latency.
Node Count	Number of nodes registered by system
Node Listener Port	Listener port of node (Used to receive unicast messages)

TIP:

In case of a disconnect of a Master Node in the network, the next master is chosen by looking at all Nodes running as Node Type 1 (Auto Master). The node that has the highest Uptime including Timestamp becomes the new master. This node changes its type to 2 (Master) and starts its services as such.



TCNet Status Packet

Functionality	Status PACKET of current settings on node.
Type	Broadcast
Port	UDP(60000)
Size	100 (+ App Specific Data)
Behavior	Broadcast every 1000ms

PARAMETERS	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	6	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	5	Type 2: TCNet STATUS	V1-0
Node Name	8	8	ASCII TEXT*	Node Name	V3-1
SEQ	16	1	0-255	Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
Data					
Layer 1 Source	24	1	0-255	Layer 1 Source	V3-3
Layer 2 Source	25	1	0-255	Layer 2 Source	V3-3
Layer 3 Source	26	1	0-255	Layer 3 Source	V3-3
Layer 4 Source	27	1	0-255	Layer 4 Source	V3-3
Layer A Source	28	1	0-255	Layer A Source	V3-3
Layer B Source	29	1	0-255	Layer B Source	V3-3
Layer M Source	30	1	0-255	Layer M Source	V3-3
Layer C Source	31	1	0-255	Layer C Source	V3-3
Layer 1 Status	32	1	0-255	Layer 1 Status	V3-3
Layer 2 Status	33	1	0-255	Layer 2 Status	V3-3
Layer 3 Status	34	1	0-255	Layer 3 Status	V3-3
Layer 4 Status	35	1	0-255	Layer 4 Status	V3-3
Layer A Status	36	1	0-255	Layer A Status	V3-3
Layer B Status	37	1	0-255	Layer B Status	V3-3
Layer M Status	38	1	0-255	Layer M Status	V3-3
Layer C Status	39	1	0-255	Layer C Status	V3-3
Layer 1 Track ID	40	4	0-FFFFFF* (LITTLE ENDIAN)	Assigned Track ID for Layer 1	V3-3
Layer 2 Track ID	44	4	0-FFFFFF* (LITTLE ENDIAN)	Assigned Track ID for Layer 2	V3-3
Layer 3 Track ID	48	4	0-FFFFFF* (LITTLE ENDIAN)	Assigned Track ID for Layer 3	V3-3
Layer 4 Track ID	52	4	0-FFFFFF* (LITTLE ENDIAN)	Assigned Track ID for Layer 4	V3-3
Layer A Track ID	56	4	0-FFFFFF* (LITTLE ENDIAN)	Assigned Track ID for Layer A	V3-3
Layer B Track ID	60	4	0-FFFFFF* (LITTLE ENDIAN)	Assigned Track ID for Layer B	V3-3
Layer M Track ID	64	4	0-FFFFFF* (LITTLE ENDIAN)	Assigned Track ID for Layer M	V3-3
Layer C Track ID	68	4	0-FFFFFF* (LITTLE ENDIAN)	Assigned Track ID for Layer C	V3-3
RESERVED	72	1		RESERVED	V3-3
SMPTE Mode	73	1	0-255	SMPTE Mode	V3-3
Auto Master Mode	74	1	0-255	RESERVED	V3-3
RESERVED	75	25		RESERVED	V3-3
APP SPECIFIC	100	>		APP SPECIFIC	V3-3

* See details below:



TCNet Status Packet – Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet: STATUS - Value=5
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Time stamp in microseconds that is used to calculate network latency.
Layer Source	Source number of layer
Layer Status	Status of layer (Can be combined) Example: Bit 0: OFF=Offline, ON=Online Bit 1: OFF=Stopped, ON=Running Bit 2: RESERVED Bit 3: RESERVED Bit 4: RESERVED Bit 5: RESERVED Bit 6: RESERVED Bit 7: RESERVED
Layer Track ID	Track ID of track loaded on layer
SMPTE Mode	SMPTE Mode set on node
Auto Master Mode	Auto Master mode on node (0=Disabled, 1=HTP Master, 2=Link Master)
App Specific	Application Specific Data

TCNet Time Sync Packet

Functionality	Send and Receive Time Sync Data.
Type	Unicast
Port	UDP(Target-Node-Port)
Size	32
Behavior	Response Required

PARAMETERS	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	1	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	10	Type 10: TCNet Time Sync Packet	V1-0
Node Name	8	8	ASCII TEXT*	Node Name	V3-1
SEQ	16	1	0-255	Sequence Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
Data					
STEP	24	1	0-3	Step No	V3-1
RESERVED	25	1		RESERVED	
Node Listener Port	26	2	65023-65535 (LITTLE ENDIAN)	Listener Port for Unicast Messages	V3-2
Remote Timestamp	28	4	0-999999 (LITTLE ENDIAN)	Timestamp of Remote Node	V3-2

* See details below:

TCNet Time Sync Packet - Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet. - Value=10
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Time stamp in microseconds that is used to calculate network latency.
Step	Current step in process (0=Initialize, 1=Response)
Node Listener Port	Listener port of node (Used to receive unicast messages)
Remote Timestamp	Time stamp send by remote node in Sync Message

TCNet Time Sync Packet – Usage

Step 1:

Initializer send a TCNet Time Sync Message to remote node with Timestamp=Current timer in microseconds and STEP number=0

Step 2:

Remote node receives message and sends message back with Timestamp=Remote node's current timer in microseconds, STEP number=1 and Remote Timestamp= Initializer's original timestamp

Step 3:

Initializer received message back and calculates remote node's current time by:

Delay = (Current timer – Remote timestamp) / 2)

Time of remote node = Timestamp + Delay

Optional:

In order to get a more accurate timing, you can initialize the routine again and calculate more accurate by:

Delay 1 = (Current timer – Remote timestamp) / 2)

Delay 2 = (Current timer – Remote timestamp) / 2)

Time of remote node = Timestamp + ((Delay1+Delay2) / 2)

Note:

To keep track of this time, for each remote node, an internal timer should be created to keep track of current time of node.



TCNet Error / Notification

Functionality	Notifies that a request is not handled
Type	Unicast
Port	UDP(Target-Node-Port)
Size	30
Behavior	Send when a request is not handled or caused an error or for notifications, this message is sent back to notify requesting node.

PARAMETERS	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	1	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	13	Type 13: TCNet Error Notification	V1-0
Node Name	8	8	ASCII TEXT*	Node Name	V3-1
SEQ	16	1	0-255	Sequence Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
Data					
Datatype	24	1	0-FF	Data type of Request	V3-1
Layer ID	25	1	0-FF	Layer ID of original request	V3-1
Code	26	2	(LITTLE ENDIAN)	Returned Code	V3-1
Message Type	28	2	(LITTLE ENDIAN)	Message type of Request	V3-1

* See details below:

TCNet Error / Notification - Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet: - Value=13
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Time stamp in microseconds that is used to calculate network latency.
Data type	Data type of failed request
Layer ID	Layer ID of original request. If request was not targeted for specific layer, this value = 0
Code	Error / Notification Code. The following protocol codes are defined 001 – Request Unknown (An unknown request is made) 013 – Request Not Possible/Featured (A request is recognized but can't be handled by node) 014 – Request Data = EMPTY (When a request is made for data and data is empty, this could be used to notify requesting node that there is nothing to send. 255 – Request Response: OK
Message Type	Request ID (Message Type)

TCNet Request Packet

Functionality	Request Data from other Node
Type	Unicast
Port	UDP(Target-Node-Port)
Size	26
Behavior	Request is sent to a master or repeater node. As result the node will send back a packet containing small wave data or a request error message.

PARAMETERS	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	1	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	20	Type 20: TCNet Request Packet	V1-0
Node Name	8	8	ASCII TEXT*	Node Name	V3-1
SEQ	16	1	0-255	Sequence Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
Data					
Data Type	24	1	0-255	Data Type	V3-1
Layer	25	1	0-255	Layer where data belongs to	V3-1

* See details below:

TCNet Request Packet - Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet: - Value=20
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Time stamp in microseconds that is used to calculate network latency.
Data Type	Data Type to request
Layer	Layer where Data is requested for

TCNet Control Packet

Functionality	Send and Receive Control Packets to control nodes remotely.
Type	Unicast
Port	UDP(Target-Node-Port)
Size	42 + Datasize
Behavior	Response Required

PARAMETERS	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	1	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	101	Type 101: TCNet Control	V1-0
Node Name	8	8	ASCII TEXT*	Node Name	V3-1
SEQ	16	1	0-255	Sequence Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
STEP	24	1	0-1	Step No	V3-1
RESERVED	25	1		RESERVED	
Data Size	26	4	(LITTLE ENDIAN)	Total Data Size	V3-2
RESERVED	30	12		RESERVED	
Data					
Control Path	42	Data Size	ASCII TEXT	String with Control Path	V3-2

* See details below:

TCNet Control Packet – Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet. - Value=101
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Timestamp in microseconds that is used to calculate network latency.
Step	Current step in process (0=Initialize, 1=Response)
Control Path	String with Control Path, examples:

To stop a layer remotely: **layer/1/state=6;** (6=stop)
 To set layer A source layer 1: **layer/5/source=1;**
 To set layer M source layer A: **layer/7/source=5;**
 To set state to "play" on layer 2 and force a resync on layer 2: **layer/2/state=3; layer/2/resync;**

As control paths differ per application, contact your software vendor to obtain correct control path's.



TCNet Text Data Packet

Functionality	Send and Receive Text Data Packets to control nodes remotely.
Type	Broadcast/Unicast
Port	UDP(6000 or Target-Node-Port)
Size	42 + Data size
Behavior	Response Required

PARAMETERS	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	1	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	128	Type 128: TCNet Text Data	V1-0
Node Name	8	8	ASCII TEXT*	Node Name	V3-1
SEQ	16	1	0-255	Sequence Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
STEP	24	1	0-1	Step No	V3-1
RESERVED	25	1		RESERVED	
Data Size	26	4	(LITTLE ENDIAN)	Total Data Size	V3-2
RESERVED	30	12		RESERVED	
Data					
Text Data	42	Data Size	ASCII TEXT	String Text Data	V3-2

* See details below:

TCNet Text Data Packet – Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet. - Value=128
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Time stamp in microseconds that is used to calculate network latency.
Step	Current step in process (0=Initialize, 1=Response)
Text Data	Raw text data string

TCNet Keyboard Data Packet

Functionality	Send and Receive Realtime Keyboard Data Packets to control nodes remotely.
Type	Broadcast/Unicast
Port	UDP(6000 or Target-Node-Port)
Size	44
Behavior	Response Required

PARAMETERS	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	1	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	132	Type 132: TCNet Keyboard Data	V3-2
Node Name	8	8	ASCII TEXT*	Node Name	V3-1
SEQ	16	1	0-255	Sequence Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
RESERVED	24	1		RESERVED	V3-2
RESERVED	25	1		RESERVED	V3-2
Data Size	26	4	(LITTLE ENDIAN)	Total Data Size	V3-2
RESERVED	30	12		RESERVED	V3-2
Data					
Keyboard Data	42	2	HEX ASCII Code	Keyboard Data	V3-2

* See details below:

TCNet Keyboard Data Packet – Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet. - Value=132
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Timestamp in microseconds that is used to calculate network latency.
Step	Current step in process (0=Initialize, 1=Response)
Keyboard Data	Raw text data string

TCNet Data Packet – Metrics Data

Functionality	Updates Data for Layer
Type	Unicast
Port	UDP(Target-Node-Port)
Size	122
Behavior	Unicast when cache changes.

PARAMETER	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	1	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	200	Type 200: TCNet Data Packet	V1-0
Node Name	8	8	ASCII TEXT*	Node Name / Signature	V3-1
SEQ	16	1	0-255	Sequence Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
Data					
Data Type	24	1	2	Datatype 2 = Metrics	V2-0
Layer ID	25	1	0-FF*	Layer Number	V2-0
RESERVED	26	1		RESERVED	V2-0
Layer State	27	1	0-FF*	Layer State	V2-0
RESERVED	28	1		RESERVED	V2-0
Sync Master	29	1	0-FF*	Sync Master	V2-0
RESERVED	30	1		RESERVED	V2-0
Beat Marker	31	1	0-4*	Beat Marker	V2-0
Track Length	32	4	0-0x5265C00 (LITTLE ENDIAN)	Track Length in Milliseconds	V2-0
Current Position	36	4	0-0x5265C00 (LITTLE ENDIAN)	Playhead Position in Milliseconds	V2-0
Speed	40	4	0-20000 (LITTLE ENDIAN)	Playhead Speed	V3-2
RESERVED	44	1		RESERVED	V3-0
Beat Number	57	4	(LITTLE ENDIAN)	Beat Number	V3-0
RESERVED	61-111	51			V3-0
BPM	112	4	0-0x1869F* (LITTLE ENDIAN)	BPM	V3-0
Pitch Bend	116	2	(16-BIT) 0-FFFF* (LITTLE ENDIAN)	Pitch Bend	V3-0
Track ID	118	4	0-FFFFFFF* (LITTLE ENDIAN)	Assigned Track ID	V3-0

* See details next page



TCNet Data Packet - Metrics Data - Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet. - Value=200
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Time stamp in microseconds that is used to calculate network latency.
Data Type	Datatype of TCNet Data Packet. (Metrics Data = 2)
Layer ID	Layer number of layer sending data. Example: LAYER1, 2=LAYER2, 3=LAYER3, 4=LAYER4, 5=LAYER A, 6=LAYER B, 7=MASTER OUT, 8=RESERVED
Layer State	Play head status of layer Example: 0=IDLE, 3=PLAYING, 4=LOOPING, 5=PAUSED, 6=STOPPED, 7=CUE BUTTON DOWN, 8=PLATTER DOWN, 9=FFWD, 10=FFRV, 11=HOLD
Sync Master	Sync master status of layer. Example use of this status is to follow the current active layer and allows auto cue to this layer. Example: 0=Slave / 1=Master
Beat Marker	Beat marker status of layer - Range: 1~4
Track Length	Total track length of layer in milliseconds Example: 0~9999.9999 sec
Location Marker	Play head position of layer Example: 0~9999.9999 sec
Speed Value	Play head speed on layer Example: -0~65536 (Where 32768 = 100% speed, 0 = 0% Speed, 65536=200% speed)
Beat Number	Current Beat Number
BPM Value	Play head BPM speed of layer Example: 0.01~999.99
Speed Bend Value	Play head speed bend value of layer. (Used for live adjust.) Example: 0~65536 (Where 32768 = 100% speed, 0 = 0% Speed, 65536=200% speed)
Track ID	Track ID number of the track that is loaded on layer. This is usually the database ID number. (Used to reflect track selection changes)

Note:

This info can be requested from a node by sending a TCNet Request Data packet, with Datatype=2, Parameter 1=LAYER, Parameter 2=0



TCNet Data Packet - Meta Data

Functionality	Contains metadata of a layer
Type	Unicast
Port	UDP(Target-Node-Port)
Size	542 (May change in future FLAMES)
Behavior	Unicast on update event or upon request

PARAMETER	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	1	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	200	Type 200: TCNet Data Packet	V1-0
Node Name	8	8	ASCII TEXT*	Node Name / Signature	V3-1
SEQ	16	1	0-255	Sequence Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
Data					
Data Type	24	1	4	Datatype 4 = Metadata	V1-0
Layer ID	25	1	0-FF*	Layer ID	V1-0
RESERVED	26	1		RESERVED	V1-0
RESERVED	27	2		RESERVED	V1-0
Track Artist	29	256	ASCII TEXT	Track Artist Name	V1-0
Track Title	285	256	ASCII TEXT	Track Title Name	V1-0
Track Key	541	2	(LITTLE ENDIAN)	Track KEY	V3-2

* See details below:

TCNet Data Packet - Meta Data – Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet. - Value=200
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Timestamp in microseconds that is used to calculate network latency.
Data Type	Datatype of TCNet Meta Data Packet.
Layer ID	Layer number if layer sending data. Example: LAYER1, 2=LAYER2, 3=LAYER3, 4=LAYER4, 5=LAYER A, 6=LAYER B, 7=MASTER OUT, 8=RESERVED
Track ID	Track ID number of the track that is loaded on layer. This is usually the source's database ID number.
Track Artist	Artist name of content loaded to layer - Example: My Artist Name (Max 256 characters)
Track Name	Track name of content loaded to layer - Example: My Track Title (Max 256 characters)
Track KEY	Audio Key of track

Note:

This info can be requested from a node by sending a TCNet Request Data packet, with Datatype=4, Parameter 1=LAYER, Parameter 2=0

TCNet Data Packet - Beat Grid Data

Functionality	Contains Beat Grid Data of layer
Type	Unicast
Port	UDP(Target-Node-Port)
Size	2442 (May change in future FLAMES)
Behavior	Unicast upon request

PARAMETER	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	1	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	200	Type 200: TCNet Data Packet	V1-0
Node Name	8	8	ASCII TEXT*	Node Name / Signature	V3-1
SEQ	16	1	0-255	Sequence Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
Data Type	24	1	8	Datatype 8 = Beat Grid Data	V3-2
Layer ID	25	1	1-8	Layer Number	V3-2
Data Size	26	4	(LITTLE ENDIAN)	Total Data Size	V3-2
Total Packet	30	4	0-FF*	Total Packets used for data	V3-2
Packet No	34 **	4	(LITTLE ENDIAN)	Packet Number	V3-2
Data Cluster Size	38	4	2400 (LITTLE ENDIAN)	Data Cluster Size	V3-2
Data **					
Beat Number	42 + OFFSET***	2	(LITTLE ENDIAN)	Beat Number	V3-2
Beat Type	44 + OFFSET***	1	(LITTLE ENDIAN)	20 = Downbeat, 10 = Up Beat	V3-2
RESERVED	45 + OFFSET***	1		RESERVED	V3-2
Beat Time Stamp	46 + OFFSET***	4	(LITTLE ENDIAN)	Timestamp in MS	V3-2

* See details below:

** Data should be split in multiple packets where each packet has a maximum of 2400 bytes of Data (Max Packet Size = 2442)

*** OFFSET = (Beat Number * 8) – (Packet No * 2400)

TCNet Data Packet - Beat Grid Data - Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet. - Value=200
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Time stamp in microseconds that is used to calculate network latency.
Data Type	Datatype of TCNet Data Packet. (Beat Grid Data=8)
Layer ID	Layer number if layer sending data. Example: LAYER1, 2=LAYER2, 3=LAYER3, 4=LAYER4, 5=LAYER A, 6=LAYER B, 7=MASTER OUT, 8=RESERVED
Total Packets	Total amount of packets for data (LITTLE ENDIAN)
Packet No	Packet number of data (LITTLE ENDIAN)
Data Size	Total data size. Is total of all data send, including in extra packets (LITTLE ENDIAN)
Data Cluster Size	Cluster Size of data (Amount of bytes used per cluster to split up total data. – Standard value = 32000)
Beat Number	Beat Number (LITTLE ENDIAN)
Beat Type	Beat Type (20=Down Beat, 10=Upbeat)
Beat Time	Beat Timestamp in MS

Note:

This info can be requested from a node by sending a TCNet Request Data packet, with Datatype=8, Layer=The layer you request data from

TCNet Data Packet - CUE Data

Functionality	Contains Cue Data of Layer
Type	Unicast
Port	UDP(Target-Node-Port)
Size	50 (May change in future FLAMES)
Behavior	Unicast upon request

PARAMETER	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	1	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	200	Type 200: TCNet Data Packet	V1-0
Node Name	8	8	ASCII TEXT*	Node Name / Signature	V3-1
SEQ	16	1	0-255	Sequence Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
Data Type	24	1	12	Datatype 12 = Cue Data	V3-2
Layer ID	25	1	1-8	Layer Number	V3-2
RESERVED	26	16		RESERVED	V3-2
Data					
Loop IN	42	4	(LITTLE ENDIAN)	Loop IN Time	V3-2
Loop OUT	46	4	(LITTLE ENDIAN)	Loop OUT Time	V3-2

* See details below:

TCNet Data Packet - CUE Data - Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet. - Value=200
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Time stamp in microseconds that is used to calculate network latency.
Data Type	Datatype of TCNet Data Packet. (Cue Data=12)
Layer ID	Layer number if layer sending data. Example: LAYER1, 2=LAYER2, 3=LAYER3, 4=LAYER4, 5=LAYER A, 6=LAYER B, 7=MASTER OUT, 8=RESERVED
Loop IN	Time of Loop IN
Loop OUT	Time of Loop OUT

Note:

This info can be requested from a node by sending a TCNet Request Data packet, with Datatype=12, Layer=The layer you request data from

TCNet Data Packet - Small Wave Form Data

Functionality	Contains Small Wave Form Data of layer
Type	Unicast
Port	UDP(Target-Node-Port)
Size	2442 (May change in future FLAMES)
Behavior	Unicast upon request

PARAMETER	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	1	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	200	Type 200: TCNet Data Packet	V1-0
Node Name	8	8	ASCII TEXT*	Node Name / Signature	V3-1
SEQ	16	1	0-255	Sequence Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
Data Type	24	1	16	Datatype 16 = Small Waveform	V3-2
Layer ID	25	1	1-8	Layer Number	V3-2
Data Size	26	4	Size=2400 (LITTLE ENDIAN)	Total Datasize	V3-2
Total Packet	30	4	0-FF*	Total Packets used for data	V3-2
Packet No	34	4	(LITTLE ENDIAN)	Packet Number	V3-2
RESERVED	38	4		RESERVED	V3-2
Data					
Waveform Data	42-2441	2400	BLevel (Odd Bytes) / BColor (Even Bytes) -0-FF	Wave Form Data as Bar Levels/Bar Colors	V3-2

* See details below:

TCNet Data Packet – Small Wave Form Data - Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet. - Value=200
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Time stamp in microseconds that is used to calculate network latency.
Data Type	Datatype of TCNet Data Packet. (Small Waveform=16)
Layer ID	Layer number if layer sending data. Example: LAYER1, 2=LAYER2, 3=LAYER3, 4=LAYER4, 5=LAYER A, 6=LAYER B, 7=MASTER OUT, 8=RESERVED
Total Packets	Total number of packets for data (LITTLE ENDIAN)
Packet No	Packet number of data
Data Size	Total data size
Waveform Data	Wave form data: Odd bytes are Bar Levels, Even bytes are Bar Colors (Total = 1200x2 = 2400 bytes)

Note:

This info can be requested from a node by sending a TCNet Request Data packet, with Datatype=16, Layer=The layer you request data from

TCNet Data Packet – Big Wave Form Data

Functionality	Contains Small Wave Form Data of layer
Type	Unicast
Port	UDP(Target-Node-Port)
Size	Depending on track length
Behavior	Unicast upon request

PARAMETER	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	1	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	200	Type 200: TCNet Data Packet	V1-0
Node Name	8	8	ASCII TEXT*	Node Name / Signature	V3-1
SEQ	16	1	0-255	Sequence Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
Data Type	24	1	32	Datatype 32 = Big Waveform	V3-2
Layer ID	25	1	1-8	Layer Number	V3-2
Data Size	26	4	TOTAL DATA SIZE	Total Data size	V3-2
Total Packet	30	4	0-FF*	Total Packets used for data	V3-2
Packet No	34	4	(LITTLE ENDIAN)	Packet Number	V3-2
Data Cluster Size	38	4	Standard: 4800 (LITTLE ENDIAN)	Data Cluster Size	V3-2
Data					
Waveform Data	42 – Max 4842	Max 4842	BLevel (Odd Bytes) / BColor (Even Bytes) -0-FF	Wave Form Data as Bar Levels/Bar Colors	V3-2

* See details below:

TCNet Data Packet - Big Wave Form Data - Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet. - Value=200
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Time stamp in microseconds that is used to calculate network latency.
Data Type	Datatype of TCNet Data Packet. (Big Waveform=32)
Layer ID	Layer number if layer sending data. Example: LAYER1, 2=LAYER2, 3=LAYER3, 4=LAYER4, 5=LAYER A, 6=LAYER B, 7=MASTER OUT, 8=RESERVED
Total Packets	Total amount of packets for data (LITTLE ENDIAN)
Packet No	Packet number of data
Data Size	Total data size. Is total of all data send, including in extra packets (LITTLE ENDIAN)
Data Cluster Size	Cluster Size of data (Amount of bytes used per cluster to split up total data. – Standard value = 32000)
Waveform Data	Wave form data: Odd bytes are Bar Levels, Even bytes are Bar Colors

Note:

This info can be requested from a node by sending a TCNet Request Data packet, with Datatype=32, Layer=The layer you request data from

TCNet Data File Packet - Low Res Artwork File

Functionality	Contains Low Res Artwork file (JPEG Format)
Type	Unicast
Port	UDP(Target-Node-Port)
Size	Depending on file size
Behavior	Unicast upon request

PARAMETER	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	1	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	204	Type 204: TCNet File Data File Packet	V3-2
Node Name	8	8	ASCII TEXT*	Node Name / Signature	V3-1
SEQ	16	1	0-255	Sequence Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
Data Type	24	1	128	Datatype 128 = Low Res Artwork File	V3-2
Layer ID	25	1	1-8	Layer Number	V3-2
Data Size	26	4	TOTAL DATA SIZE	Total Data size	V3-2
Total Packet	30	4	0-FF*	Total Packets used for data	V3-2
Packet No	34	4	(LITTLE ENDIAN)	Packet Number	V3-2
Data Cluster Size	38	4	Standard: 4800 (LITTLE ENDIAN)	Data Cluster Size	V3-2
Data					
File Data	42 – Max 4842	Max 4842	RAW FILE DATA	RAW FILE DATA	V3-2

* See details below:

TCNet Data File Packet – Low Res Artwork File - Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet. - Value=204
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Timestamp in microseconds that is used to calculate network latency.
Data Type	Datatype of TCNet Data Packet. (Low Res Artwork File=128)
Layer ID	Layer number if layer sending data. Example: LAYER1, 2=LAYER2, 3=LAYER3, 4=LAYER4, 5=LAYER A, 6=LAYER B, 7=MASTER OUT, 8=RESERVED
Total Packets	Total number of packets for data (LITTLE ENDIAN)
Packet No	Packet number of data
Data Size	Total data size. Is total of all data send, including in extra packets (LITTLE ENDIAN)
Data Cluster Size	Cluster Size of data (Amount of bytes used per cluster to split up total data. – Standard value = 32000)
File Data	Raw file data of JPEG file

Note:

This info can be requested from a node by sending a TCNet Request Data packet, with Datatype=12, Layer=The layer you request data from

TCNet Application Specific Data Packet

Functionality	Application Specific Broadcasted Data
Type	Broadcast / Unicast
Port	UDP(60001) for Broadcast or Target-Node-Port for Unicast
Size	Data Size
Behavior	Broadcast or Unicast depending on application

PARAMETERS	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	1	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	30	Type 30: TCNet Application Specific Data Packet	V1-0
Node Name	8	8	ASCII TEXT*	Node Name / Signature	V3-1
SEQ	16	1	0-255	Sequence Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
Data Identifier 1	24	1	0-255	Application Identifier Signature 1/2 (Defaults to 0)	V3-0
Data Identifier 2	25	1	0-255	Application Identifier Signature 2/2 (Defaults to 0)	V3-0
Data Size	26	4	(LITTLE ENDIAN)	Data Size of all packets	V3-0
Total Packets	30	4	(LITTLE ENDIAN)	Total of all packets	V3-0
Packet No	34	4	(LITTLE ENDIAN)	Packet No	V3-0
Packet Signature	38	4	178260640 (LITTLE ENDIAN)	Signature of Packet	V3-0
Data					
Data	42	Data Size		Data	V3-0

* See details below:

TCNet Application Specific Data Packet - Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet. - Value=30
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Time stamp in microseconds that is used to calculate network latency.
Application Identifier	4 Byte Application Code. This code is used to identify application.
Data Size	Data Size in Little Endian
Total Packets	Total number of packets for data (LITTLE ENDIAN)
Packet No	Packet number of data
Packet Signature	Packet Signature (LITTLE ENDIAN)
Data	Data



TCNet Time Packet

Functionality	Constant stream of timing data of layers
Type	Broadcast
Port	UDP(60001)
Size	154 (May change in future FLAMES)
Behavior	Unicast every 1ms - 40ms or at time critical event.

PARAMETER	BYTE #	SIZE	VALUE	DESCRIPTION	FLAME
Management Header					
Node ID	0	2	(LITTLE ENDIAN)	Node ID of sending device	V1-0
Protocol Version (Major)	2	1	3	Protocol Version (Major) of sending device	V1-0
Protocol Version (Minor)	3	1	1	Protocol Version (Minor) of sending device	V1-0
Header	4	3	TCN	TCNet Protocol Header	V3-1
Message Type	7	1	254	Type 254: TCNet Time Packet	V1-0
Node Name	8	8	ASCII TEXT*	Node Name / Signature	V3-1
SEQ	16	1	0-255	Sequence Number	V3-1
Node Type	17	1	0-255	Node Type	V3-1
Node Options	18	2	(LITTLE ENDIAN)	Node Options	V3-1
Timestamp in Microseconds	20	4	0-999999 (LITTLE ENDIAN)	Timestamp in Microseconds	V3-1
Data					
L1 Time	24	4	0-0x55D4A80 (LITTLE ENDIAN)	LAYER 1 Current Time in Milliseconds	V3-0
L2 Time	28	4	0-0x55D4A80 (LITTLE ENDIAN)	LAYER 2 Current Time in Milliseconds	V3-0
L3 Time	32	4	0-0x55D4A80 (LITTLE ENDIAN)	LAYER 3 Current Time in Milliseconds	V3-0
L4 Time	36	4	0-0x55D4A80 (LITTLE ENDIAN)	LAYER 4 Current Time in Milliseconds	V3-0
LA Time	40	4	0-0x55D4A80 (LITTLE ENDIAN)	LAYER A Current Time in Milliseconds	V3-0
LB Time	44	4	0-0x55D4A80 (LITTLE ENDIAN)	LAYER B Current Time in Milliseconds	V3-0
LM Time	48	4	0-0x55D4A80 (LITTLE ENDIAN)	LAYER M Current Time in Milliseconds	V3-0
LC Time	48	4	0-0x55D4A80 (LITTLE ENDIAN)	LAYER C Current Time in Milliseconds	V3-0
L1 Total Time	56	4	0-0x55D4A80 (LITTLE ENDIAN)	LAYER 1 Total Time in Milliseconds	V3-0
L2 Total Time	60	4	0-0x55D4A80 (LITTLE ENDIAN)	LAYER 2 Total Time in Milliseconds	V3-0
L3 Total Time	64	4	0-0x55D4A80 (LITTLE ENDIAN)	LAYER 3 Total Time in Milliseconds	V3-0
L4 Total Time	68	4	0-0x55D4A80 (LITTLE ENDIAN)	LAYER 4 Total Time in Milliseconds	V3-0
LA Total Time	72	4	0-0x55D4A80 (LITTLE ENDIAN)	LAYER A Total Time in Milliseconds	V3-0
LB Total Time	76	4	0-0x55D4A80 (LITTLE ENDIAN)	LAYER B Total Time in Milliseconds	V3-0
LM Total Time	80	4	0-0x55D4A80 (LITTLE ENDIAN)	LAYER M Total Time in Milliseconds	V3-0
LC Total Time	84	4	0-0x55D4A80 (LITTLE ENDIAN)	LAYER C Total Time in Milliseconds	V3-
L1 Beat Marker	88	1	0-4	Layer 1 Beatmarker	V3-0
L2 Beat Marker	89	1	0-4	Layer 2 Beatmarker	V3-0
L3 Beat Marker	90	1	0-4	Layer 3 Beatmarker	V3-0
L4 Beat Marker	91	1	0-4	Layer 4 Beatmarker	V3-0
LA Beat Marker	92	1	0-4	Layer A Beatmarker	V3-0
LB Beat Marker	93	1	0-4	Layer B Beatmarker	V3-0
LM Beat Marker	94	1	0-4	Layer M Beatmarker	V3-0
LC Beat Marker	94	1	0-4	Layer C Beatmarker	V3-0
L1 Layer State	96	1	0-FF	Layer 1 Layer State	V3-0
L2 Layer State	97	1	0-FF	Layer 2 Layer State	V3-0
L3 Layer State	98	1	0-FF	Layer 3 Layer State	V3-0
L4 Layer State	99	1	0-FF	Layer 4 Layer State	V3-0
LA Layer State	100	1	0-FF	Layer A State	V3-0
LB Layer State	101	1	0-FF	Layer B State	V3-0
LM Layer State	102	1	0-FF	Layer M State	V3-0

* Resumes next page

TCNet Time Packet

* Resumed from previous page

Data (Resume)						
LC Layer State	103	1	0-FF	Layer C State	V3-0	
L1 Layer OnAir	104	1	0-1	Layer OnAir State	V3-2	
L2 Layer OnAir	105	1	0-1	Layer OnAir State	V3-2	
L3 Layer OnAir	106	1	0-1	Layer OnAir State	V3-2	
L4 Layer OnAir	107	1	0-1	Layer OnAir State	V3-2	
LA Layer OnAir	108	1	0-1	Layer OnAir State	V3-2	
LB Layer OnAir	109	1	0-1	Layer OnAir State	V3-2	
LM Layer OnAir	110	1	0-1	Layer OnAir State	V3-2	
LC Layer OnAir	111	1	0-1	Layer OnAir State	V3-2	
RESERVED	112	42		RESERVED	V3-2	

* Resumes next page

TCNet Time Packet – Details

Node ID	Unique Node ID. When multiple applications/services are running on same IP, this number must be unique.
Protocol Version	Protocol version of source that sends the packet. - Example: 1.00 would be: 01 00
Header	TCNet Protocol Header (Must be "TCN")
Message Type	Message type of packet. - Value=254
Node Name	GW Code of software/machine/source that sends packet. (8 Characters) Example: ABCDEFGH
SEQ	Sequence number of packet. (See Sequence number)
Node Type	Node Type Example: 1=Auto, 2=Master, 4=Slave, 8=Repeater
Node Options	Node options: See Node Options
Timestamp	Time stamp in microseconds that is used to calculate network latency.
LX Time	Layer X Time in MS
LX Total Time	Layer X Total time in MS
LX Beatmarker	Layer X Beatmarker position (0=unknown, 1-4=Beatmarker pos)
LX Layer State	Layer X Layer State (Example: 0=IDLE, 3=PLAYING, 4=LOOPING, 5=PAUSED, 6=STOPPED, 7=CUE BUTTON DOWN, 8=PLATTER DOWN, 9=FFWD, 10=FFRV, 11=HOLD)
LX Layer OnAir	Layer X Layer OnAir State (Example: 0=Not on Air, 1=On Air)



Contribute

Contribution can be done by submitting your changes/idea's to info@eiglive.com.



Registered Application Codes

If you require an Application code, please contact dev@eiglive.com

0000	Reserved for Public	
0AA0	Pioneer DJ	http://www.pioneerdj.com
0AAA	TC Supply / ShowKontrol	http://www.showkontrol.com
0AAB	TC Supply Pyrotechnic Systems	http://www.tc-supply.com
0AAC	TC Supply Ride Control Systems	http://www.tc-supply.com
0AB0	Avolites Lighting	http://www.avolites.com
0AB1	MA Lighting	http://www.malighting.com
0AB3	Chamsys Lighting	http://www.chamsys.co.uk
0AB4	Obsidian Control	http://www.obsidiancontrol.com
0ABA	Arkaos Software	http://www.arkaos.net
0ABB	BLCKBOOK / Time Code Sync	http://www.timecodesync.com
0ABC	Resolume Software	http://www.resolume.com
0ABD	Green Hippo	http://www.green-hippo.com
0ABE	RD/ShowCockpit	http://www.showcockpit.com
0ABF	Disguise	http://disguise.one
FFFF	Reserved for Public	

TCNet Change Log

04/29/19	Revision 3.3.0 Added Status Packets, Updated list of Registered Application Codes
03/28/19	Revision 3.2.8 Removed SMPTE format from timing packets
02/18/19	Revision 3.2.8 Added Node Options
02/15/19	Revision 3.2.7 Clean UP
01/10/19	Revision 3.2.6 Clean Up
12/24/18	Revision 3.2.5 Added Artwork File, Cue Data, Removed Timecode format from timing packet (deprecated)
12/20/18	Revision 3.2.4 Clean Up
12/17/18	Revision 3.2.4 Clean Up
11/27/18	Revision 3.2.2 Clean Up
11/19/18	Revision 3.2.1 Added Beat Grid Info Packet
11/10/18	Revision 3.2.0 Replaced Small Wave Form Packets to 3.2.0
10/31/18	Revision 3.1.6 (PRE FINAL)
10/26/18	Revision 3.1.5 (PRE FINAL)
09/28/18	Revision 3.1.3
02/02/18	Revision 3.0.0
12/21/17	Revision 2.1.0
10/01/17	Added Flame V2-0
05/10/16	Added Flame V1.0 (REV D)
01/17/16	Document Creation