

## ESP (DMX over ETHERNET)

Version	1.5
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Status:	Public Protocol

### Overview:

ESP is an Ethernet protocol that can be used to send DMX over Ethernet through Ethernet nodes that support the protocol. It's easy to implement and simple to use.

### Operation:

All supported ESP nodes (like ODE and Ethergate) must be configured to use ESP and set to the same universe as specified by the user in ESP packet(s).

All data and poll packets are sent to **UDP port 3333** (0xD05).  
All data must be packed/sent as per Big Endian Byte Ordering.  
Most of the packets can be sent to broadcast address.

### ESP supported Packets:

- Poll: Used to find all supported ESP nodes on the network (broadcast)
- Poll Reply: Reply by a node from a poll packet (broadcast)
- Data: DMX data packet.
- ACK / NACK: Acknowledgement packets.
- Reset Packet: Sending this packet will reset the node and update the configuration.

### Poll (UDP)

Poll packets can be sent on a specific IP or Broadcast address. (Reply Type is optional)

<i>Field</i>	<i>Name</i>	<i>Size</i>	<i>Description</i>
1	Head	4	Packet header: ESPP
2	Reply Type	1	0 = Just Reply by an ACK (heartbeat) 1 = Reply with full Information 2 = Reply with node specific data

***Poll Reply (UDP)***

Poll Reply packets are usually sent on Broadcast address.

Field	Name	Size	Description
1	Head	4	Packet header: ESPR
2	MAC	6	Mac address of node (also serial number)
3	Node Type	2	0x0001: DMX Single Output Node 0x0002: DMX Single Input Node 0x0004: Open DMX Ethernet 0x0005: Datagate 0x0007: Playback Wing 0x0008: Shortcut Wing 0x0009: Program Wing 0x000A: Datagate Mk2 0x000B: Open DMX Ethernet revB 0x0060: RS232 Node 0x0061: IO Node 0x0100 :LanWorks Node 0x0200: Simulation Software
4	Version	1	Firmware Version of Node
5	Switch settings	1	Setting of DIP switches (if available)
6	Name	10	ASCII name of node (short name)
7	Option Field	1	Option field as in Config packet
8	TOS	1	Type of service
9	TTL	1	Time to Live
10	Data	n	Node Specific Configuration, this is the same as in the Config Packet (variable size – sent if requested)

## ACK or NACK

<i>Field</i>	<i>Name</i>	<i>Size</i>	<i>Description</i>
1	Head	4	Packet header: ESAP
2	Status	1	0x00=OK (ACK) else Error Code of NACK 0x01=CRC Failed 0xFF = CRC not supported
3	CRC	1	8 bit CRC of packet received (0 if NACK) or reply to a poll

## DMX Data

DMX Data packet can be sent on a specific IP or Broadcast address. When sent to a node (set as Output), the node will output DMX. A node set as Input will broadcast this packet on the network.

<i>Field</i>	<i>Name</i>	<i>Size</i>	<i>Description</i>
1	Head	4	Packet header: ESDD
2	Universe	1	Universe assigned with this data packet
3	Start Code	1	DMX Start code (default is 0)
3	Data Type	1	1 (used to send up-to 512 bytes of DMX DATA)
4	Data Size	2	Size of the data block
5	Data	n	DMX data (512 bytes is recommended)

## Reset

Sending this packet will reset the node and load the current configuration. This packet can only be sent in a packet addressed to a single node. No reply is sent back to this packet.

<i>Field</i>	<i>Name</i>	<i>Size</i>	<i>Description</i>
1	Head	4	Packet header: ESZZ

<b><i>Field</i></b>	<b><i>Name</i></b>	<b><i>Size</i></b>	<b><i>Description</i></b>
2	Mac Address	6	Mac Address (Serial-No.) of the node to be reset