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Overled splitter:

- RDM/DMX/ splitter ampilfier
- Demultiplexer 4 - 1

DDS730 è un buffer RDM/DMX o un DEMULTIPLEXER, nella funzione **RDM/DMX** buffer si comporta come amplificatore di segnale bidirezionale, ogni porta è optoisolata e indipendente. La funzione di splitter permette di collegare ad un PRORT il DMX/RDM da un generatore o controller, poi questo viene amplificato su 4 porte che aumentano il numero di device collegabili ed il numero di linee DMX, secondo lo standard USITT DMX si possono collegare 32 dispositivi su una linea DMX con un massimo di 600 metri di cavo bilanciato e schermato. Quindi la DDS730 permette di collegare al massimo 32 dispositivi x 4 porte per un totale di 128 device mantenendo la compatibilità con RDM. In caso di guasto di una porta per un corto circuito sul cavo o un device DMX collegato rotto le rimanenti porte lavorano ugualmente dato che queste sono indipendenti.

DEMULTIPLEXER serve per far uscire su un unico canale DMX piu generatori DMX presenti sui port 1-4, quando uno dei 4 generatori DMX collegati cambia lo streaming dati questo viene rilanciato sul port5. Questa funzione è utile nel caso ci siano diversi generatori DMX ed una unica linea DMX con controller, il segnale sul port 5 viene inviato ad ogni cambio di uno dei port da 1-4.

DDS730 buffer RDM/DMX or DEMULTIPLEXER,in the **RDM/DMX buffer** can be used as DMX amplifier compatible with RDM,each port is optoinsulated and can control 32 device and 600mt cable in according with standard USITT DMX specification. In case one of the port is in short circuit or one connected device is on failure the remaning other ports can work anyway.

DEMULTIPLEXER use 4 port (port1-4) as input DMX and use port number 5 as output, in case from port 1-4 the DMX signal have same data streaming the DEMULTIPLEXER send to port 5 the last port that have DMX data stream changed. This can be usefull for several DMX generator and one DMX port, for example in case of use of 4 DMX keyboard generator and one DMX controller, connecting the 4 Keyboard to port 1-4 if one of the keyboard change data stream the data will be sent to port5 as priority, same happen in case of another keyboard will be used.

Overled Buffer_DMX/RDM

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DDS730: DMX Demultiplexer 4 to 1

Il canale selezionato e' quello che ha avuto il piu' recente cambiamento di contenuto e viene rilanciato sulla port numero 5.

- Buffer FIFO dedicato per ogni porta;
- DMX in uscita con ritardo minimo rispetto a quello in entrata, tipicamente nell'ordine delle centinaia di microsecondi;

- Commutazione sincrona anche se ingressi totalmente asincroni: il passaggio fra un ingresso e l'altro avviene in modo coerente con i break dei rispettivi due segnali in ingresso (quello attivo attualmente e quello che sta per diventare attivo) senza glitch, sovrapposizione di parti di frames, etc etc nonostante i due segnali possano potenzialmente avere timing totalmente differenti;

- Commutazione con immunita' a disturbi: occorrono almeno quattro frames diversi affinche' il canale diventi attivo. Cio' scongiura attivazioni di ingressi a causa di sporadici errori di ricezione;

- Il DMX in uscita viene sospeso se cessa sulla porta attiva in entrata: il dispositivo e' quindi perfettamente trasparente (funzionano anche le modalita IF NO DMX).
La seriale in uscita replica quanto ricevuto su quella attiva di ingresso (una di quattro) con un ritardo minimo: la generazione del BREAK inizia quando esso viene rilevato in ingresso (framing error, ovvero dopo circa 40us) ed i bytes seguono uno dopo l'altro poco dopo essere staati ricevuti.L'aggiornamento e' istantaneo, ovvero il frame in uscita e' la copia di quello in ingresso gia' nel momento in cui la sua ricezione e' in corso: non ci sono ritardi di uno o piu' frames prima che il cambiamento si rifletta in uscita.

Indicatori LED:
Una coppia rosso/verde dedicata ad ogni porta di ingresso.

Verde: Acceso fisso = ingresso pronto; lampeggiante = presenza di DMX in ingresso.

Rosso: Indica qual e' la porta attualmente attiva in uscita.

DDS730: DMX Demultiplexer 4 to 1

The port 1 to 4 are for DMX input data from 4 DMX generator, the first input port that change data stream will be redirect to port5, if DMX controller connected they will receive the DMX data.

- Buffer FIFO for each port 1-4
- DMX minumum latency of DMX from input to output

- Syncronus commutation of input even if the input data on the port is asyncronus, the BREAK is coerent with DMX and the glitch are filtered by the software.

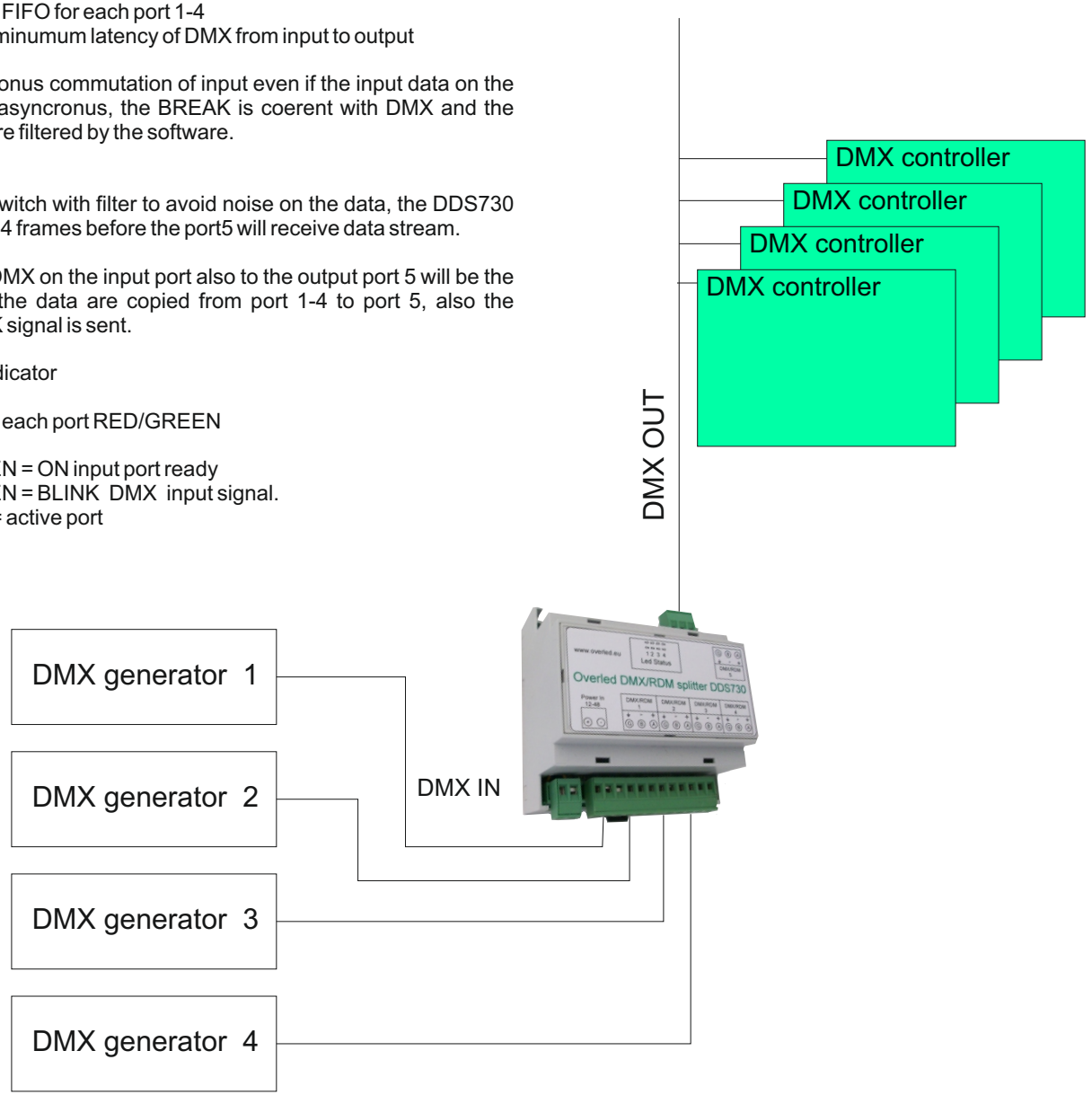
- Port switch with filter to avoid noise on the data, the DDS730 wait for 4 frames before the port5 will receive data stream.

- If no DMX on the input port also to the output port 5 will be the same, the data are copied from port 1-4 to port 5, also the BREAK signal is sent.

LED indicator

- 2 LED each port RED/GREEN

- GREEN = ON input port ready
- GREEN = BLINK DMX input signal.
- RED = active port



Overled Buffer_DMX/RDM

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DDS730: DMX / RDM BUFFER

In questa modalità il modulo DDS730 lavora come amplificatore di segnale DMX ma con la possibilità di trasmettere anche RDM, questo significa che il segnale oltre ad essere amplificato è anche trasmesso e ricevuto. Al modulo DDS730 è possibile collegare un generatore di segnale DMX e 4 linee di uscita, ogni linea DMX è in grado di sopportare fino a 32 device connessi e 600mt di cavo come da specifica USITT.
Ogni port è optoisolato e rispetto agli altri, rendendo estremamente affidabile questo BUFFER, i segnali sono riprodotti sui port con la massima affidabilità quindi i BREAK DMX e le collisioni per RDM.
Si consiglia l'utilizzo dei port 1 - 4 come uscite bufferate e il port5 come ingresso DMX da amplificare.In caso su uno dei port sia presente un corto circuito o un problema su i dispositivi collegati, gli altri canali lavorano ugualmente.

Indicatori a LED

Una coppia rosso/verde dedicata ad ogni porta di ingresso.

Verde: Acceso fisso = ingresso pronto;
lampeggiante = presenza di DMX in ingresso.

Rosso: Indica qual e' la porta attualmente attiva in uscita.

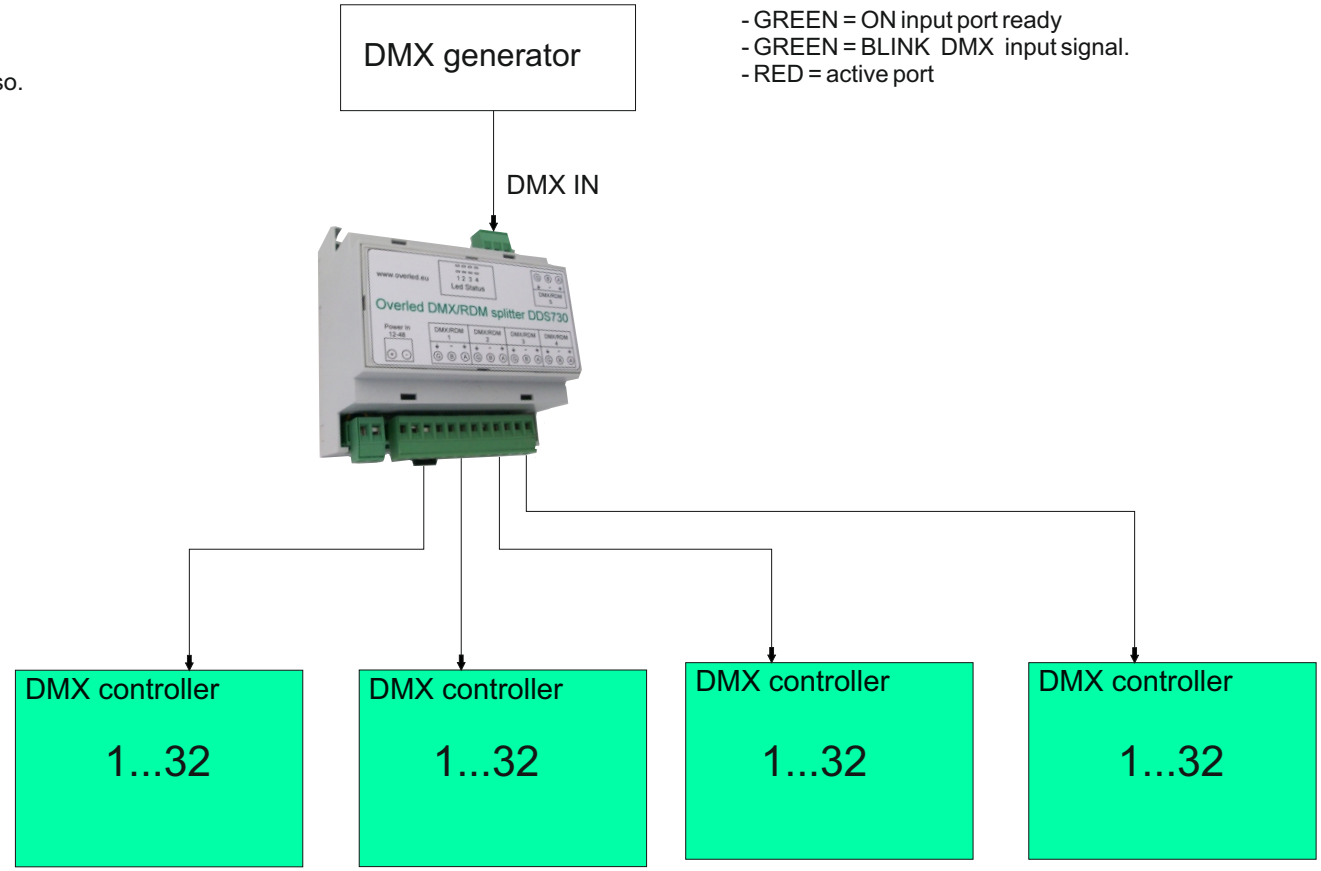
DDS730: DMX / RDM BUFFER

Buffer mode the DDS730 amplify one DMX input to 4 DMX output. To each output 32 DMX devices can be connected with 600mt maximum cable long as for USITT standard.
The output DMX PORT are optoinsulated and in case of failure of connected device or shor circuit the remaining output work indipentelely.
The port 1 to 4 are for output DMX signal, port5 is for input DMX signal, this buffer is also RDM compliant, all signal from port 5 to port 1-4 are trasmitted with same timing like BREAK or collision for RDM discovery device.

LED indicator

- 2 LED each port RED/GREEN

- GREEN = ON input port ready
- GREEN = BLINK DMX input signal.
- RED = active port



Overled Buffer_DMX/RDM

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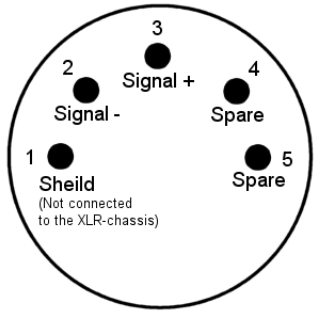
DMX connector



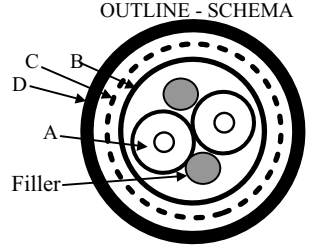
Pin 1 = signal reference = cable shield
Pin 2 = signal inversion = ' - ' or B, blue
Pin 3 = signal = ' + ' or A, red
Pin 4 = not used
Pin 5 = not used

DMX cable specification

DESCRIPTION: Round Cable Sec. 2x0.25 mm² d.5.50 mm
DESCRIZIONE: Cavo tondo sez. 2x0.25 mm² d.5.50 mm

FLAMAR COD: -
CUSTOMER CODE: -

OUTLINE - SCHEMA



A

Conductor Conduttore

Material	Materiale	Bare Copper	
Conductor nr.	N.dei conduttori	2	
Stranding	Trefolatura	14x0.15	mm
Section nom	Sezione nominale	0.25	mm²
Electric resistance	Resistenza elettrica	<77.5 (IEC 344)	Ω/km
Insulation material	Materiale di isolam.	PE	
Color ins.	Colore isolamento	Red-Blue	
Hardness ins.	Durezza isolamento	55	Shore D
Diameter	Diametro	1.75+/-0.10	

1th Shielding 1° Schermo B

Material	Materiale	Tape Al-Pet (Al outside)	

2nd Shielding 2° Schermo C

Material	Materiale	Tin Copper	
Avg. coverage	Copertura media	95	%
Electric resistance	Resistenza elettrica	<35	Ω/km

Protectiv Cover Guaina D

Material	Materiale	PVC	
Color	Colore	Black	
Hardness	Durezza	76	Shore A
Diameter	Diametro	5.50+/-0.20	mm

Marcatura a ink-jet da definire

Temperature Rating:	-20°C to +70°C
Voltage Rating:	30V (Only Electronic use, not for Power)
Dielectric Strength	2000Vx1'
Capacità nominale c/c	64 pF/m
Impedenza nominale	120 Ohm

Cable conforming to: Standard 2002/95/CE (RoHS)
Packaging Confezionamento Bobina d.230

Overled Buffer_DMX/RDM

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DMX512

Developed by the Engineering Commission of United States Institute for Theatre Technology (USITT), the standard was created in 1986, with subsequent revisions in 1990 leading to USITT DMX512/1990.DMX512-A In 1998 the Entertainment Services and Technology Association (ESTA) began a revision process to develop the standard as an ANSI standard. The resulting revised standard, known officially as "Entertainment Technology — USITT DMX512-A — Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories", was approved by the American National Standards Institute (ANSI) in November 2004. This current standard is also known as "E1.11, USITT DMX512-A", or just "DMX512-A", and is maintained by ESTA.

Network topology

A DMX512 network employs a multi-drop bus topology with nodes strung together in what is commonly called a daisy chain. A network consists of a single DMX512 controller — which is the sole master of the network — and one or more slave devices. For example, a lighting console is frequently employed as the controller for a network of slave devices such as dimmers, fog machines and intelligent moving lights.
Each slave device has a DMX512 "IN" connector and, in many case, a DMX512 "OUT" connector (sometimes marked "THRU") as well. The controller, which has only an OUT connector, is connected via a DMX512 cable to the IN connector of the first slave. A second cable then links the OUT or THRU connector of the first slave to the IN connector of the next slave in the chain, and so on. The final, empty, OUT or THRU connector of the last slave on the daisy chain should have a terminator plugged into it. A terminator is a stand-alone male connector with a built-in resistor. The resistor — typically 120 Ω to match the cable characteristic impedance, is connected across the primary data signal pair. If a secondary data pair is used, then another termination resistor is connected across it as well. Although simple systems, i.e., systems having few devices and short cable runs, may work reliably without a terminator, it is considered good practice always to use a terminator at the end of the daisy chain. Some DMX devices have built-in terminators that can be manually activated with a mechanical switch or by software, or by automatically sensing the absence of a connected cable.
Each DMX network is called a "DMX universe". Large control desks (operator consoles) may have the capacity to control multiple universes, with an OUT connector provided for each universe.

Electrical

DMX512 data are sent using EIA-485 voltage levels. However, quoting from E1.11, "The electrical specifications of this Standard are those of EIA-485-A, except where specifically stated in this document. Where a conflict between EIA-485-A and this document exists, this document is controlling as far as this Standard is concerned."

DMX512 is a bus network no more than 1200 meters long, with not more than 32 devices on a single bus. If more than 32 devices need to communicate, the network can be expanded across parallel buses using DMX splitters. Network wiring consists of a shielded twisted pair, with a characteristic impedance of 120 Ohms, with a termination resistor at the end of the cable furthest from the controller to absorb signal reflections.

Connectors

DMX512 1990 specifies that where connectors are used, the data link shall use five-pin XLR style electrical connectors (XLR-5), with female connectors used on transmitting (OUT) ports and male connectors on receiving ports. DMX512-A (E1.11) requires the use of an XLR-5 connector, unless there is insufficient physical space on the device, in which case an XLR-5 adapter shall be supplied. DMX512-A (E1.11-2008) allows the use of eight-pin modular (RJ-45) connectors for fixed installations where regular plugging and unplugging of equipment is not required.Some DMX512 equipment manufacturers employ non-compliant connectors and pinouts; the most common of these is the three-pin XLR connector, since the electrical specification currently only defines a purpose for a single wire pair. There is risk of equipment damage if a novice unfamiliar with lighting technology accidentally plugs XLR 3-pin DMX into an audio device, since the DMX signal voltages are much higher than what audio equipment normally uses.Also, devices are sometimes fitted with four-pin connectors when both communications and power are sent through a common cable.

XLR-5 pinout

1. Signal Common
2. Data 1- (Primary Data Link)
3. Data 1+ (Primary Data Link)
4. Data 2- (Optional Secondary Data Link)
5. Data 2+ (Optional Secondary Data Link)

RJ-45 pinout

1. Data 1+
2. Data 1-
3. Data 2+
4. Not Assigned
5. Not Assigned
6. Data 2-
7. Signal Common (0 V) for Data 1
8. Signal Common (0 V) for Data 2

The RJ-45 connector pinout matches the conductor pairing scheme used by Category 5 (Cat5) twisted pair patch cables. The avoidance of pins 4 and 5 helps to prevent equipment damage, if the cabling is accidentally plugged into a single-line public switched telephone network phone jack.
Cabling for DMX512 was removed from the standard and a separate cabling standards project was started in 2004. Two cabling standards have been developed, one for portable DMX512 cables (ANSI E1.27-1 - 2006) and one for permanent installations (draft standard BSR E1.27-2). This resolved issues arising from the differences in requirements for cables used in touring shows versus those used for permanent infrastructure.
The electrical characteristics of DMX512 cable are specified in terms of impedance and capacitance, although there are often mechanical and other considerations that must be considered as well. Cable types that are appropriate for DMX512 usage will have a nominal characteristic impedance of 120 ohms. Cat5 cable, commonly used for networking and telecommunications, has been tested by ESTA for use with DMX512A. Also, cables designed for EIA485 typically meet the DMX512 electrical specifications. Conversely, microphone and line level audio cables lack the requisite electrical characteristics and thus are not suitable for DMX512 cabling. The significantly lower impedance and higher capacitance of these cables distort the DMX512 digital waveforms, which in turn can cause irregular operation or intermittent errors that are difficult to identify and correct.

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RDM Physical layer

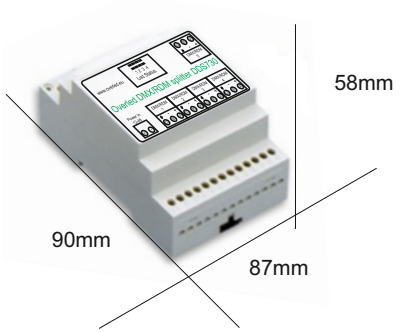
The RDM protocol and the RDM physical layer were designed to be compatible with legacy equipment. All compliant legacy DMX512 receivers should be usable in mixed systems with an RDM controller (console) and RDM responders (receivers). DMX receivers and RDM responders can be used with a legacy DMX console to form a DMX512 only system. From a user's point of view the system layout is very similar to a DMX system. The controller is placed at one end of the main cable segment. The cable is run receiver to receiver in a daisy-chain fashion. RDM enabled splitters are used the same way DMX splitters would be. The far end (the non console or splitter end) of a cable segment should be terminated.RDM requires two significant topology changes compared to DMX. However, these changes are generally internal to equipment and therefore not seen by the user.First, a controller's (console's) output is terminated. Second, this termination must provide a bias to keep the line in the 'marking state' when no driver is enabled.The reason for the additional termination is that a network segment will be driven at many points along its length. Hence, either end of the segment, if unterminated, will cause reflections.A DMX console's output drivers are always enabled. The RDM protocol is designed so that except during discovery, there should never be data collisions. To assure this lack of collisions, while making possible implementation on different platforms, there are times when all line drivers are required to be disabled. If nothing more than the termination was done, the line would float to some unknown level. In that case one or more random changes might be read on the line. These random changes greatly decrease system accuracy. So the biasing of the line is requiredTo assure this, section 2.4.1 (Line Bias Networks) of the standard says; "The command port shall provide a means to bias the termination of the data link to a value of at least 245 mV and verified by using the test circuit described in Appendix F."The standard further states that, the biasing mean "shall be polarized such that Data+ of the data link is positive with respect to Data- the data link. The Line Biasing network shall maintain this bias when the data link is loaded with the equivalent of 32 unit loads and common mode voltage is varied over the range of +7 volts to -7 voltThe standard does not require any particular circuit for providing the basis and termination; however, the simplest method is often a passive pull apart network.Whatever method is used must be tested with the chosen driver chip to see that the design combination still meets the requirement of E1.20. Tests are given in Appendix F of the standard. These tests are for design verification and are not required as production testing. Experience has shown many EIA485 drivers designed for 5 volt operation will pass the required tests. It is not so clear that all 3.3 volt parts will pass. In either case this performance must be verified. Details of the pull apart network and the tests can be found in ANSI E1.20 - 2006.

Protocol

RDM packets are inserted in-between the existing DMX data packets being used to control the lighting data. The DMX 512 specification always requires that DMX packets begin with the start code. The default Start Code is 0x00(also known as the Null Start Code). By using the start code 0xCC, RDM packets can be safely inserted between DMX data packets without older non-RDM aware devices attempting to read them.The DMX 512 specification required DMX connectors to be a 5-pin XLR type, with only the first 3 pins being used (pins 4 and 5 were reserved for "future use"). Unfortunately, various manufacturers started using the final two pins for various, proprietary purposes, such as low-voltage power or proprietary talk-back protocols. As a result, the decision was made to have all RDM communication on pins 2 and 3. This raises data collision concerns.The RDM standard addresses this problem by ensuring that in all cases (except discovery) only one device is authorized to be transmitting at any given time (somewhat similar to the token passing approach). Only the controller (of which there can be only one) can start an RDM exchange. Responders can speak only if spoken to. The controller will always initiate all RDM communication.
All RDM devices have a unique identifier (UID) that consists of a manufacturer ID and serial number.Protocol
RDM packets are inserted in-between the existing DMX data packets being used to control the lighting data. The DMX 512 specification always requires that DMX packets begin with the start code. The default Start Code is 0x00(also known as the Null Start Code). By using the start code 0xCC, RDM packets can be safely inserted between DMX data packets without older non-RDM aware devices attempting to read them.

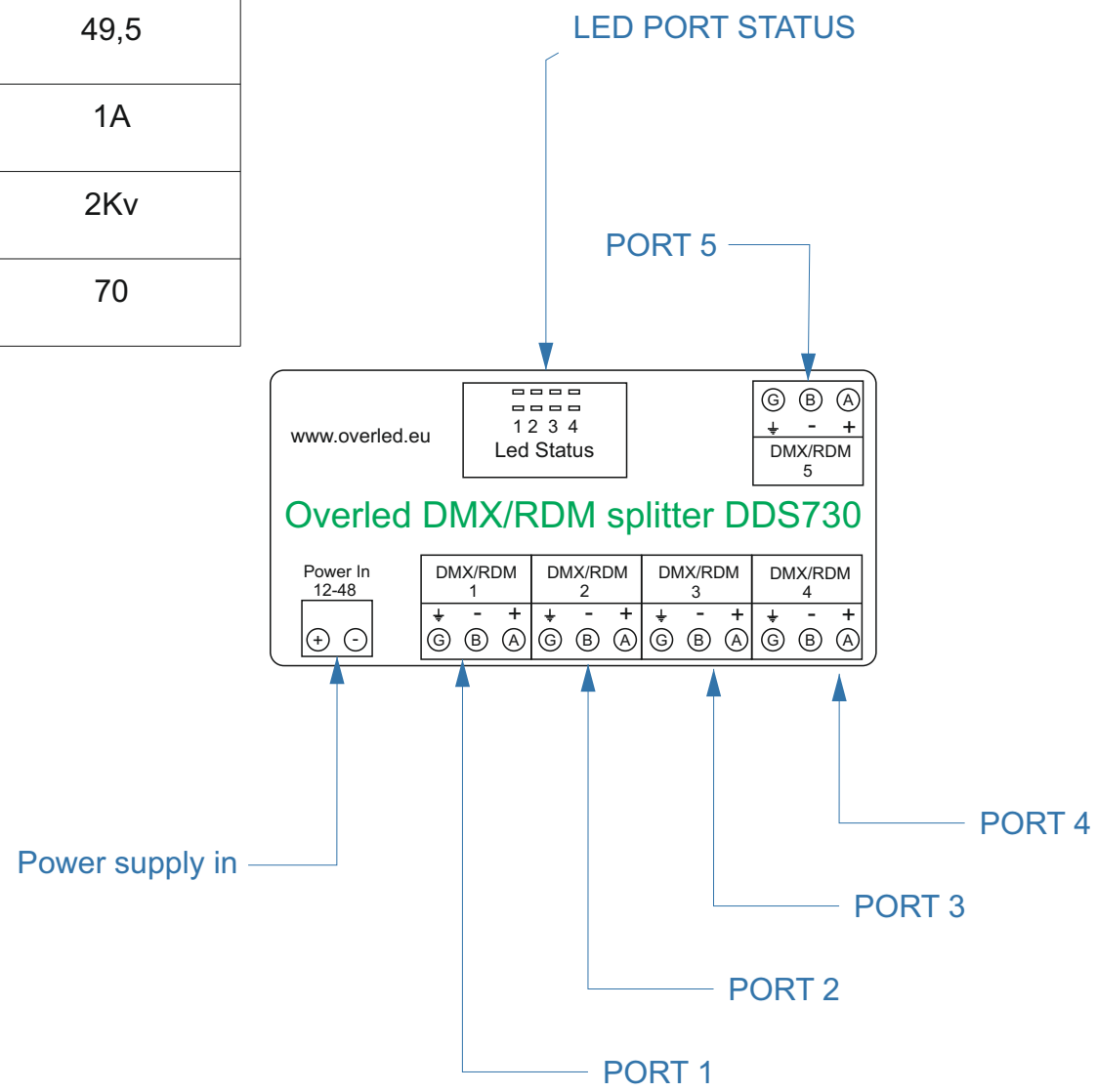
Electrical

	Min	TYP	MAX
VOLTAGE	11,5		49,5
CURRENT	0.1A	500mA	1A
DMX insulation			2Kv
Tamb C	-10	40	70



DIN bar mounting

Ordering Code:
DDS730-Buffer
DDS730-Demultiplexer



Overled Buffer_DMX/RDM