

## General

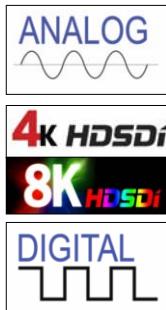
Signal distribution is one of the most prevalent activities within communication, telemetry, and SatCom system designs. Our compact 1RU sized MDU4 unit provides a flexible, low cost and reliable platform to mix-n-match a variety of signal distribution and conversion elements including RS530, 422 digital, TTL, PCM, SDI Video, RF signals, and other signal types to 3GHz.

Standard features include monitored redundant power supplies and independent dual AC inputs. Designed to operate 24/7, our MDU4 is one of those items you just don't have to worry about. It's simple, reliable, capable, and high performance. Visual and audible power supply alarms are included. An optional SNMP 10/100 Ethernet error trap for power supply status and alarm monitoring is available (contact factory).

The MDU4 chassis features a four element bay that allows you to install and power any mix of our MDU4 elements to suit your requirement. Special elements can also be built to satisfy most any unique distribution or signal conversion demands.

The unit can be rack mounted (telemetry, industrial or SatCom installations), or bench-top (for R&D or test applications). The MDU4 includes both removable rack-mount flanges and rubber feet. Our unique flange design allows the unit to be mounted rear facing, mid, or front facing (see page 9 for examples).

**Model MDU4**  
 Four Slot Modular  
 Distribution Unit  
 (1RU)



**Removable Flange Kit**  
 Leave off for bench-top, or install for flexible  
 rack mounting in rear, front or mid-facing  
 (rubber feet included, but not shown)



Made in the USA

MDU4-001

## MDU4 Elements and Assemblies

Our MDU4 has many different element types available that feature various capabilities.

Below are some popular elements types. Contact the factory for other types or custom options.

Element	Signal	Config	Description	Slots	Page
A2	ECL	Single 1x4	Digital differential ECL distribution (400Mbps) SMA connectors (10 total), 50 ohm impedance, four output pairs	1	3
C1	TTL	Single 1x8	Digital single-ended TTL (PCM) distribution (50Mbps) BNC connectors (9 total), 50 or 75ohm impedance (jumper selectable)	1	3
C2	TTL	Dual 1x4	Digital single-ended TTL (PCM) distribution (50Mbps) BNC connectors (10 total), 50 or 75ohm impedance (jumper selectable)	1	3
C3	TTL	Triple 1x2	Digital single-ended TTL (PCM) distribution (50Mbps) BNC connectors (9 total), 50 or 75ohm impedance (jumper selectable)	1	3
C4	TTL	Single 1x16	Digital single-ended TTL (PCM) distribution (50Mbps), wire BNC connectors (17 total), 50 or 75ohm impedance (jumper selectable)	2	4
D8	422	8-Pair 1x4	Digital differential 422 distribution (50Mbps), eight pairs of 1x4 DB25 connectors (5 total), 100 ohm	2	4
DB	422	2-Pair 1x4	Digital differential 422 distribution (50Mbps), two pairs of 1x4, plus expander DB25 connectors (5 total), 100 ohm	2	4
F2	TTL/422	Dual 1x4	Digital conversion and distribution, TTL input, differential 422 outputs (50Mbps) BNC input, Triaxial output connectors, 50 or 75 ohm input (selectable)	1	4
F5	TTL/422	Five 1x1	Digital conversion, TTL input, differential 422 output (50Mbps) BNC input, Triaxial output connectors, 50 or 75 ohm input (selectable)	1	5
G2	422/TTL	Dual 1x4	Digital conversion and distribution, differential 422 input, TTL outputs (50Mbps) Triaxial input, BNC output connectors, 100 ohm input	1	5
G5	422/TTL	Five 1x1	Digital conversion, differential 422 input, TTL output (50Mbps) Triaxial input, BNC output connectors, 100 ohm input	1	5
M1	20-3000MHz	Single 1x8	RF multi-coupler (RF distribution), unity gain, wideband, -1dB >+5dBm, NF <10dB, <2,0:1 VSWR SMA connectors (9 total), 50 ohm impedance	1	5
M2	20-3000MHz	Dual 1x4	RF multi-coupler (RF distribution), unity gain, wideband, -1dB >+5dBm, NF <10dB, <2,0:1 VSWR SMA connectors (9 total), 50 ohm impedance	1	6
T1	422	Single 1x8	Digital differential 422 distribution (50Mbps) Triaxial connectors (9 total), 100 ohm	1	6
T2	422	Dual 1x4	Digital differential 422 distribution (50Mbps) Triaxial connectors (10 total), 100 ohm	1	6
T3	422	Triple 1x2	Digital differential 422 distribution (50Mbps) Triaxial connectors (9 total), 100 ohm	1	6
U1	SDI HD-SDI	Single 1x8	Digital video distribution: UHD-SDI (4K & 8K), HD-SDI with EQ, reclock, cable-driver (SMPTE ST-2082, ST-2081, ST-424, ST-292 signals), BNC connectors (9 total), 75 ohm	1	7
U2	SDI UHD-SDI	Dual 1x4	Digital video distribution: UHD-SDI (4K & 8K), HD-SDI with EQ, reclock, cable-driver (SMPTE ST-2082, ST-2081, ST-424, ST-292 signals), BNC connectors (10 total), 75 ohm	1	7
U3	SDI HD-SDI	Triple 1x2	Digital video distribution: UHD-SDI (4K & 8K), HD-SDI with EQ, reclock, cable-driver (SMPTE ST-2082, ST-2081, ST-424, ST-292 signals), BNC connectors (10 total), 75 ohm	1	7
V1	Analog DC-200MHz	Single 1x8	Analog video distribution (DC-200MHz): baseband video, PCM, TTL, NTSC, instrumentation BNC connectors (9 total), 75 ohm	1	7
V2	Analog DC-200MHz	Dual 1x4	Analog video distribution (DC-200MHz): baseband video, PCM, TTL, NTSC, instrumentation BNC connectors (10 total), 75 ohm	1	8
W1	422	Single 1x8	Digital differential 422 distribution (50Mbps) Amphenol 31-2225 type Twinaxial connectors (9 total), 100 ohm	1	8
W2	422	Dual 1x4	Digital differential 422 distribution (50Mbps) Amphenol 31-2225 type Twinaxial connectors (10 total), 100 ohm	1	8
W3	422	Triple 1x2	Digital differential 422 distribution (50Mbps) Amphenol 31-2225 type Twinaxial connectors (9 total), 100 ohm	1	8

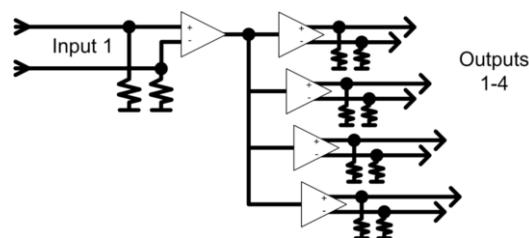
## Element XMDU4-A2

### Single 1x4 Differential ECL Distribution

Function ..... Differential ECL 1x4 distribution  
 Signal type ..... ECL  
 Sections per element ..... Single differential 1x4  
 Data rate ..... Up to 400Mbps  
 Signal connector ..... SMA  
 Impedance ..... 50 ohm  
 Size ..... Single slot


**A2**


**XMDU4-A2**  
 Differential ECL distribution with individual drivers and SMA connectors.



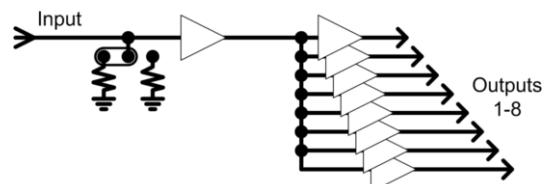
## Element XMDU4-C1

### Single 1x8 TTL Distribution

Function ..... Single-ended TTL 1x8 distribution  
 Signal type ..... TTL (PCM)  
 Sections per element ..... Single 1x8  
 Data rate ..... Up to 50Mbps  
 Signal connector ..... BNC (75)  
 Impedance ..... 50 or 75 ohm (jumper selectable)  
 Size ..... Single slot


**C1**

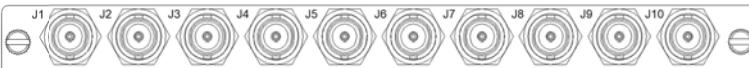

**XMDU4-C1**  
 Single-ended TTL 1x8 distribution with individual drivers, jumper selectable input termination, and BNC connectors.



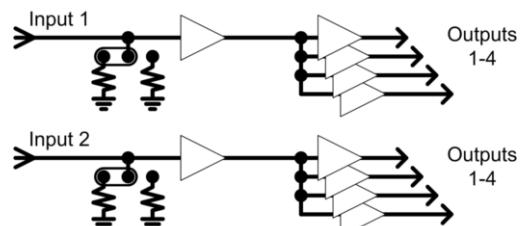
## Element XMDU4-C2

### Dual 1x4 TTL Distribution

Function ..... Single-ended TTL 1x4 distribution  
 Signal type ..... TTL (PCM)  
 Sections per element ..... Dual 1x4  
 Data rate ..... Up to 50Mbps  
 Signal connector ..... BNC (75)  
 Impedance ..... 50 or 75 ohm (jumper selectable)  
 Size ..... Single slot


**C2**


**XMDU4-C2**  
 Dual section single-ended TTL 1x4 distribution with individual drivers, jumper selectable input termination, and BNC connectors.



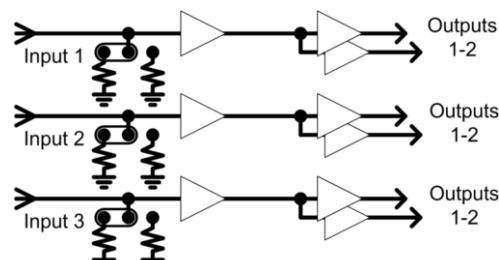
## Element XMDU4-C3

### Triple 1x2 TTL Distribution

Function ..... Single-ended TTL 1x2 distribution  
 Signal type ..... TTL (PCM)  
 Sections per element ..... Triple 1x2  
 Data rate ..... Up to 50Mbps  
 Signal connector ..... BNC (75)  
 Impedance ..... 50 or 75 ohm (jumper selectable)  
 Size ..... Single slot

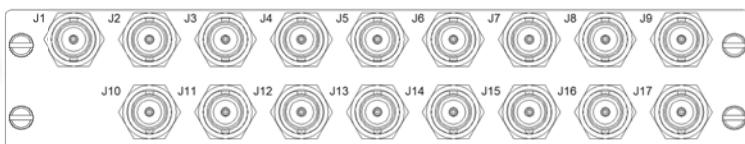

**C3**


**XMDU4-C3**  
 Triple section single-ended TTL 1x2 distribution with individual drivers, jumper selectable input termination, and BNC connectors.

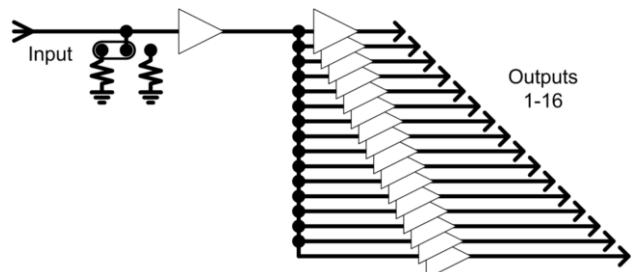


## Element XMDU4-C4 Single 1x16 TTL Distribution

Function ..... Single-ended TTL 1x16 distribution  
 Signal type ..... TTL (PCM)  
 Sections per element ..... Single 1x8  
 Data rate ..... Up to 50Mbps  
 Signal connector ..... BNC (75)  
 Impedance ..... 50 or 75 ohm (jumper selectable)  
 Size ..... Double slot

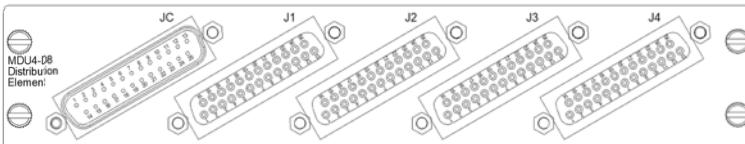

**C4**


**XMDU4-C4**  
 Single-ended TTL 1x16 distribution with individual drivers, jumper selectable input termination, and BNC connectors.

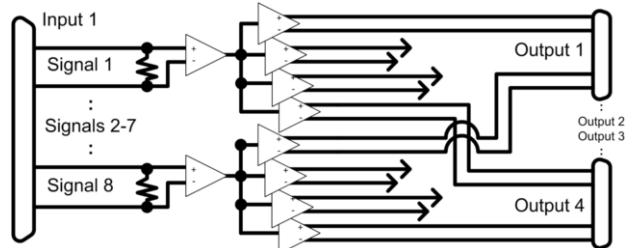


## Element XMDU4-D8 Single 8-Pair 1x4 Distribution

Function ..... Differential 422 1x4 distribution  
 Signal type ..... .422  
 Sections per element ..... Single 8-pair 1x4  
 Data rate ..... Up to 50Mbps  
 Signal connector ..... DB25 (input male, outputs female)  
 Impedance ..... 100 ohm  
 Size ..... Double slot

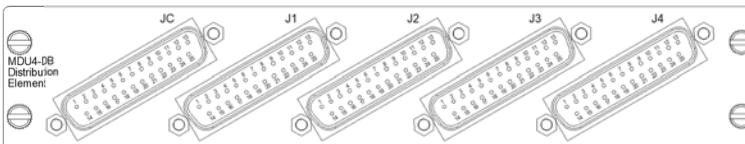

**D8**


**XMDU4-D8**  
 Differential 8-pair 422 1x4 distribution with individual drivers, 100 ohm input termination, and DB25 connectors.

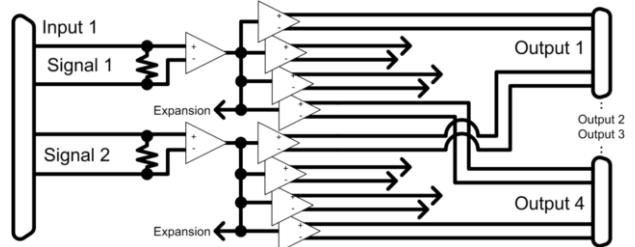


## Element XMDU4-DB Single 2-Pair 1x4 Distribution

Function ..... Differential 422 1x4 distribution  
 Signal type ..... .422  
 Sections per element ..... Single 2-pair 1x4  
 Data rate ..... Up to 50Mbps  
 Signal connector ..... DB25 (all male)  
 Impedance ..... 100 ohm  
 Size ..... Double slot

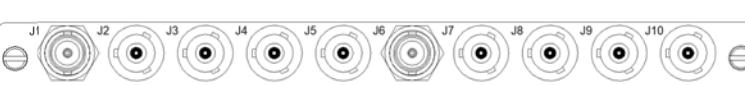

**DB**


**XMDU4-DB**  
 Differential 2-pair 422 1x4 distribution with individual drivers, 100 ohm input termination, and DB25 connectors.

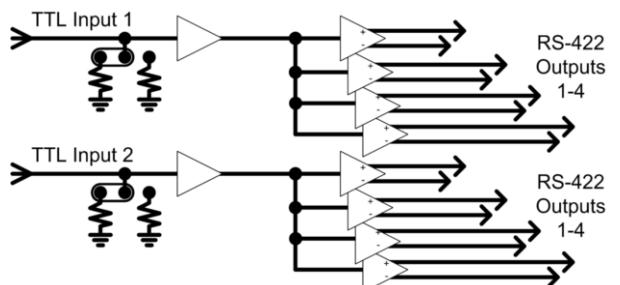


## Element XMDU4-F2 Dual 1x4 TTL to 422 Conversion & Distribution

Function ..... Single-ended TTL to 422 conversion with 1x4 distribution  
 Signal type ..... TTL to 422  
 Sections per element ..... Dual 1x4  
 Data rate ..... Up to 50Mbps  
 Signal connector ..... BNC (75) input, Triaxial output  
 Impedance ..... 50 or 75 ohm (jumper selectable)  
 Size ..... Single slot

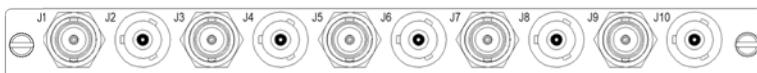

**F2**


**XMDU4-F2**  
 Dual section single-ended TTL to 422 conversion with 1x4 distribution, individual drivers, jumper selectable input termination, BNC input, Triax output connectors.

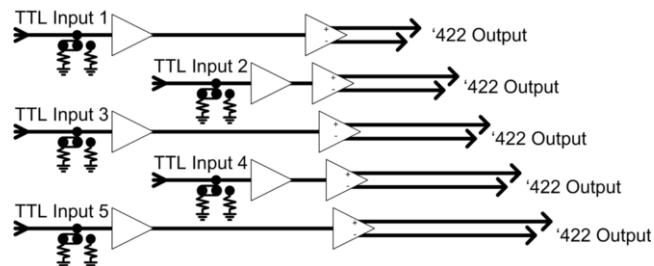


## Element XMDU4-F2 Penta (5) TTL to 422 Conversion

Function ..... Single-ended TTL to 422 conversion  
 Signal type ..... TTL to 422  
 Sections per element ..... Five 1x1  
 Data rate ..... Up to 50Mbps  
 Signal connector ..... BNC (75) input, Triaxial output  
 Impedance ..... 50 or 75 ohm (jumper selectable)  
 Size ..... Single slot

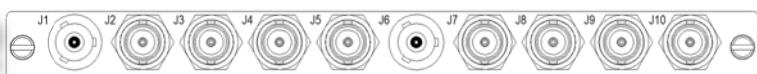

**F5**

**XMDU4-F5**

Five section single-ended TTL to 422 conversion, individual drivers, jumper selectable input termination, BNC input, Triax output connectors.

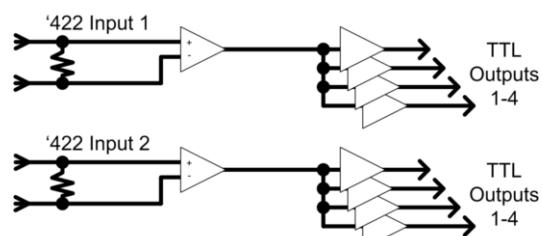


## Element XMDU4-G2 Dual 1x4 422 to TTL Conversion & Distribution

Function ..... Single-ended 422 to TTL conversion with 1x4 distribution  
 Signal type ..... 422 to TTL  
 Sections per element ..... Dual 1x4  
 Data rate ..... Up to 50Mbps  
 Signal connector ..... Triaxial input, BNC (75) output  
 Impedance ..... 100 ohm (input)  
 Size ..... Single slot

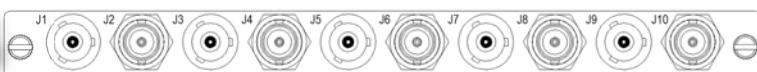

**G2**

**XMDU4-G2**

Dual section single-ended 422 to TTL conversion with 1x4 distribution, individual drivers, 100 ohm input termination, Triax input, BNC output connectors.

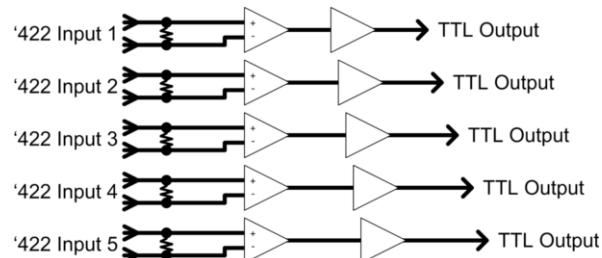


## Element XMDU4-G5 Penta (5) 422 to TTL Conversion

Function ..... Single-ended 422 to TTL conversion  
 Signal type ..... 422 to TTL  
 Sections per element ..... Five 1x1  
 Data rate ..... Up to 50Mbps  
 Signal connector ..... Triaxial input, BNC (75) output  
 Impedance ..... 100 ohm (input)  
 Size ..... Single slot

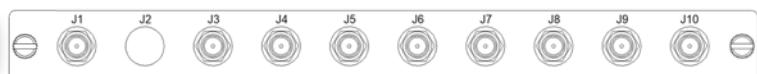

**G5**

**XMDU4-G5**

Five section single-ended 422 to TTL conversion, individual drivers, jumper selectable input termination, BNC input, Triax output connectors.

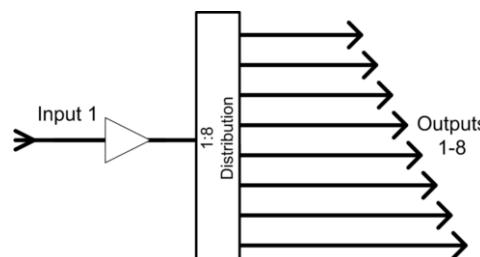


## Element XMDU4-M1 Single 1x8 RF MultiCoupler (distribution amplifier)

Function ..... RF 1x8 MultiCoupler  
 Signal type ..... Wideband RF (50MHz - 3000MHz)  
 Sections per element ..... Single 1x8  
 RF specifications ..... Flatness +/-1dB, NF <10dB, -1dBCP >0dBm  
 Signal connector ..... SMA  
 Impedance ..... 50 ohm (terminations not required on unused outputs)  
 Size ..... Single slot


**M1**

**XMDU4-M1**

Single-ended wideband RF 1x8 multicoupler (distribution), buffered outputs, SMA connectors. Simplified schematic shown.



## Element XMDU4-M2

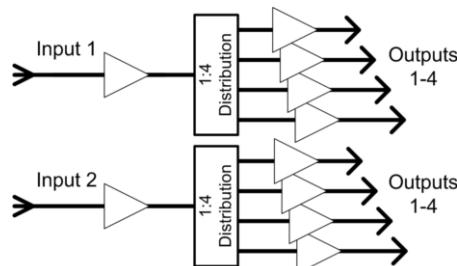
### Dual 1x4 RF MultiCoupler (distribution amplifier)

Function ..... RF 1x4 MultiCoupler  
 Signal type ..... Wideband RF (50MHz - 3000MHz)  
 Sections per element ..... Dual 1x4  
 RF specifications ..... Flatness +/-1dB, NF <10dB, -1dBCP >0dBm  
 Signal connector ..... SMA  
 Impedance ..... 50 ohm (terminations not required on unused outputs)  
 Size ..... Single slot


**M2**


#### XMDU4-M2

Dual single-ended wideband RF 1x4 multicoupler (distribution), buffered outputs, SMA connectors. Simplified schematic shown.



## Element XMDU4-T1

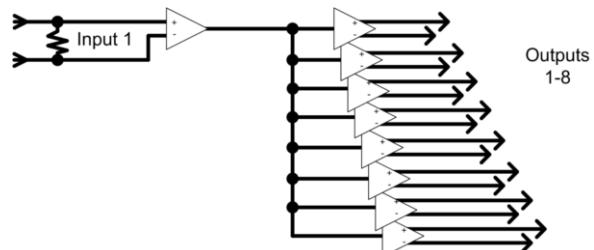
### Single 1x8 422 Distribution

Function ..... Differential 422 1x8 distribution  
 Signal type ..... .422  
 Sections per element ..... Single 1x8  
 Data rate ..... Up to 50Mbps  
 Signal connector ..... Triaxial (BJ77 type)  
 Impedance ..... 100 ohm  
 Size ..... Single slot


**T1**


#### XMDU4-T1

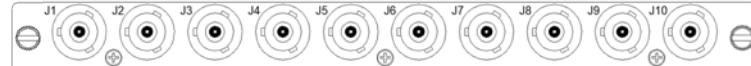
Differential (422) 1x8 distribution with individual drivers, 100 ohm input termination, and Triaxial (BJ77) connectors.



## Element XMDU4-T2

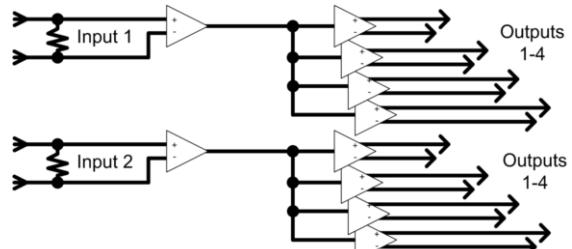
### Dual 1x4 422 Distribution

Function ..... Differential 422 1x4 distribution  
 Signal type ..... .422  
 Sections per element ..... Dual 1x4  
 Data rate ..... Up to 50Mbps  
 Signal connector ..... Triaxial (BJ77 type)  
 Impedance ..... 100 ohm  
 Size ..... Single slot


**T2**


#### XMDU4-T2

Dual differential (422) 1x4 distribution with individual drivers, 100 ohm input termination, and Triaxial (BJ77) connectors.



## Element XMDU4-T3

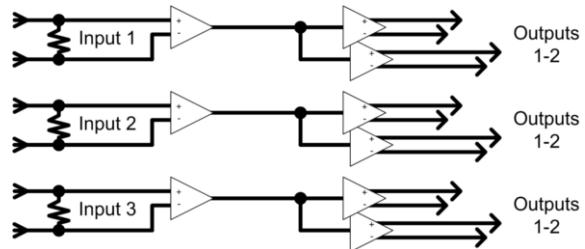
### Triple 1x2 422 Distribution

Function ..... Differential 422 1x4 distribution  
 Signal type ..... .422  
 Sections per element ..... Triple 1x2  
 Data rate ..... Up to 50Mbps  
 Signal connector ..... Triaxial (BJ77 type)  
 Impedance ..... 100 ohm  
 Size ..... Single slot


**T3**

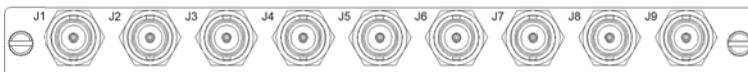

#### XMDU4-T3

Triple differential (422) 1x2 distribution with individual drivers, 100 ohm input termination, and Triaxial (BJ77) connectors.

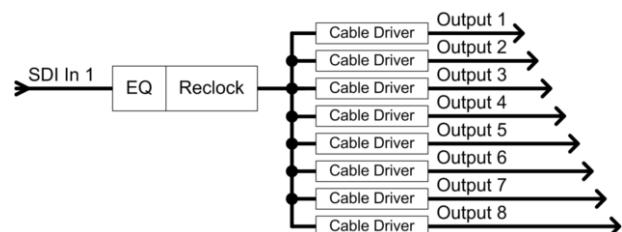


## Element XMDU4-U1 Single 1x8 Digital Video Distribution

Function ..... 1x8 Digital Video Distribution  
 Signal type ..... UHD-SDI (4K & 8K), HD-SDI & SDI  
 Sections per element ..... Single 1x8  
 Data rates ..... Any SMPTE ST-292, ST-424, ST-2081 & ST-2082  
 Signal connector ..... BNC (75)  
 Impedance ..... .75 ohm  
 Size ..... Single slot

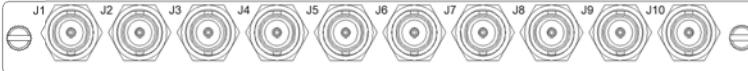

**U1**


**XMDU4-U1**  
 Single 1x8 high performance UHD-SDI (8K and lower) digital video distribution, cable EQ, reclock, individual cable drivers, BNC connectors (.75 ohm).

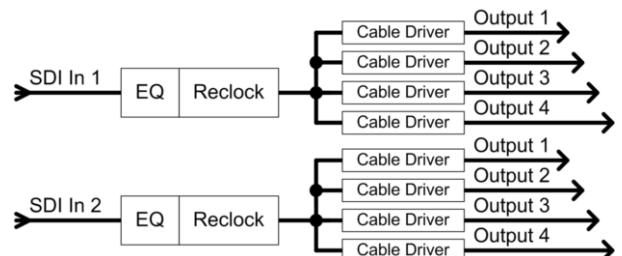


## Element XMDU4-U2 Dual 1x4 Digital Video Distribution

Function ..... 1x4 Digital Video Distribution  
 Signal type ..... UHD-SDI (4K & 8K), HD-SDI & SDI  
 Sections per element ..... Dual 1x4  
 Data rates ..... Any SMPTE ST-292, ST-424 & ST-2081 (6G-SDI)  
 Signal connector ..... BNC (75)  
 Impedance ..... .75 ohm  
 Size ..... Single slot


**U2**


**XMDU4-U2**  
 Dual section 1x4 high performance UHD-SDI (8K and lower) digital video distribution, cable EQ, reclock, individual cable drivers, BNC connectors (.75 ohm).

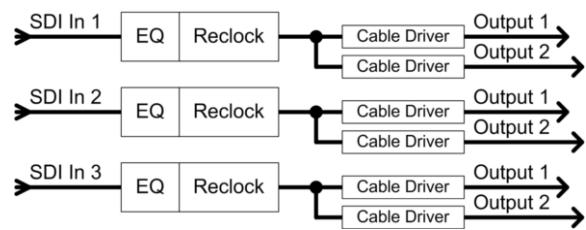


## Element XMDU4-U3 Triple 1x2 Digital Video Distribution

Function ..... 1x2 Digital Video Distribution  
 Signal type ..... UHD-SDI (4K & 8K), HD-SDI & SDI  
 Sections per element ..... Triple 1x2  
 Data rates ..... Any SMPTE ST-292, ST-424, ST-2081 & ST-2082  
 Signal connector ..... BNC (75)  
 Impedance ..... .75 ohm  
 Size ..... Single slot


**U3**


**XMDU4-U3**  
 Triple section 1x2 high performance UHD-SDI (8K and lower) digital video distribution, cable EQ, reclock, individual cable drivers, BNC connectors (.75 ohm).



## Element XMDU4-V1 Single 1x8 Analog Distribution Amplifier

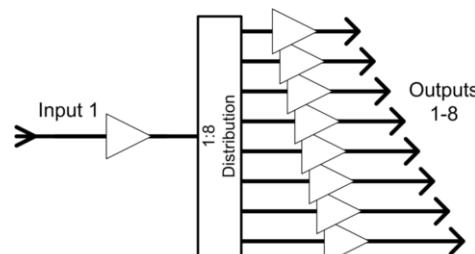
Function ..... 1x8 Video Distribution (unity gain)  
 Signal type ..... DC coupled analog (DC-200MHz typ)  
 Sections per element ..... Single 1x8  
 Analog specifications ..... +/-5Vp/p @ 25MHz, VSWR <1.4:1, +/-10V (no damage)  
 Signal connector ..... BNC  
 Impedance ..... .75 ohm  
 Size ..... Single slot



**NOTE:** For some installations, the XMDU4-F fan option can be added to enhance cooling with this element installed.

**V1**


**XMDU4-V1**  
 Single-ended DC coupled 1x8 distribution amplifier, buffered outputs, BNC connectors. Simplified schematic shown.



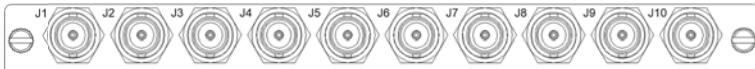
## Element XMDU4-V2

### Dual 1x4 Analog Distribution Amplifier

Function ..... 1x4 Video Distribution (unity gain)  
 Signal type ..... DC coupled analog (DC-200MHz typ)  
 Sections per element ..... Dual 1x4  
 Analog specifications ..... +/-5Vp/p @ 25MHz, VSWR <1.4:1, +/-10V (no damage)  
 Signal connector ..... BNC  
 Impedance ..... .75 ohm  
 Size ..... Single slot

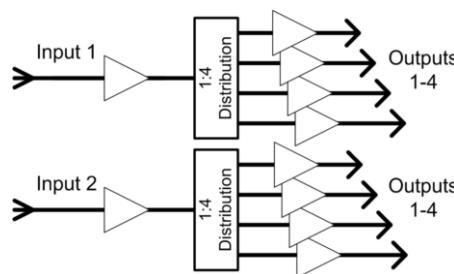


**NOTE:** For some installations, the XMDU4-F fan option can be added to enhance cooling with this element installed.

**V2**


### XMDU4-V2

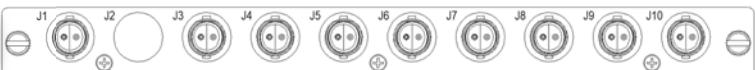
Dual section single-ended DC coupled 1x4 distribution amplifier, buffered outputs, BNC connectors. Simplified schematic shown.



## Element XMDU4-W1

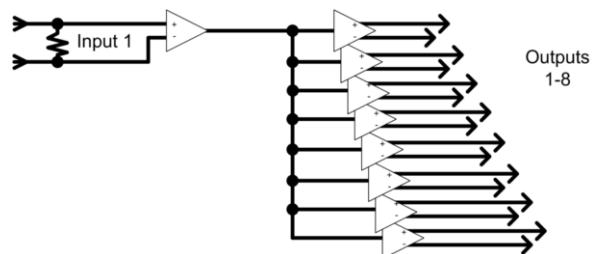
### Single 1x8 422 Distribution

Function ..... Differential 422 1x8 distribution  
 Signal type ..... .422  
 Sections per element ..... Single 1x8  
 Data rate ..... Up to 50Mbps  
 Signal connector ..... Twinaxial (polarized Amphenol 31-2225 type)  
 Impedance ..... .100 ohm  
 Size ..... Single slot


**W1**


### XMDU4-W1

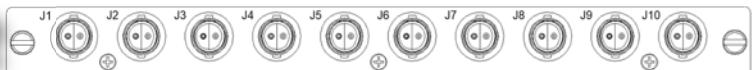
Differential (422) 1x8 distribution with individual drivers, 100 ohm input termination, and polarized Twinaxial connectors.



## Element XMDU4-W2

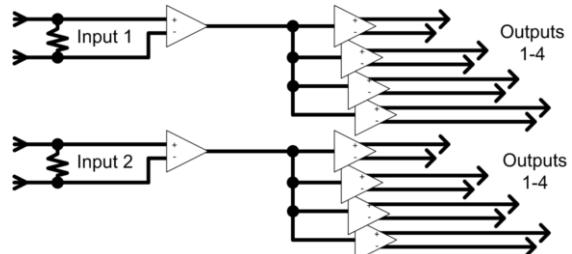
### Dual 1x4 422 Distribution

Function ..... Differential 422 1x4 distribution  
 Signal type ..... .422  
 Sections per element ..... Dual 1x4  
 Data rate ..... Up to 50Mbps  
 Signal connector ..... Twinaxial (polarized Amphenol 31-2225 type)  
 Impedance ..... .100 ohm  
 Size ..... Single slot


**W2**


### XMDU4-W2

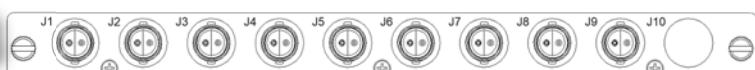
Dual differential (422) 1x4 distribution with individual drivers, 100 ohm input termination, and polarized Twinaxial connectors.



## Element XMDU4-W3

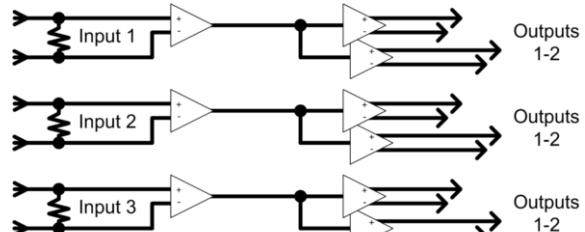
### Triple 1x2 422 Distribution

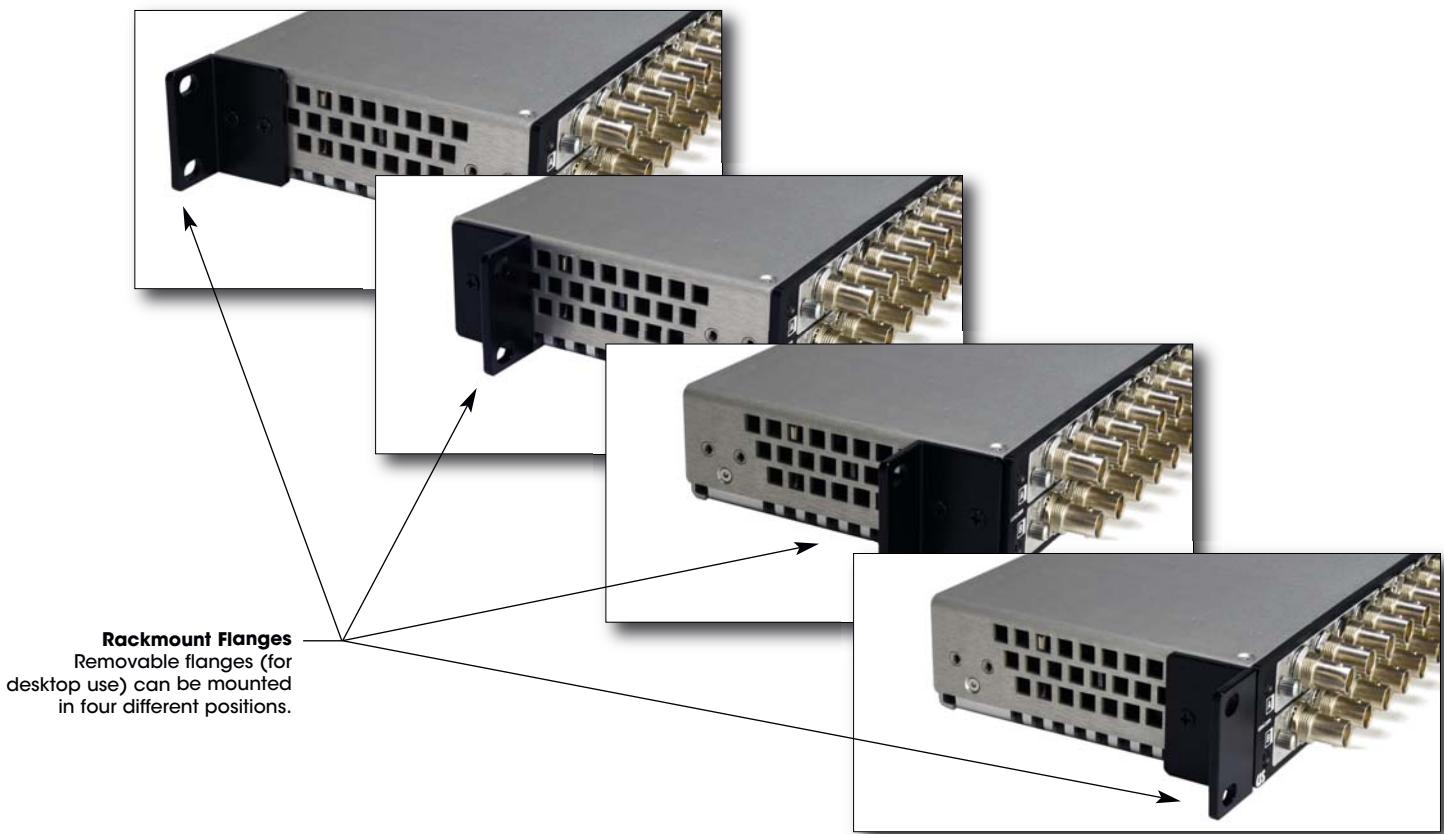
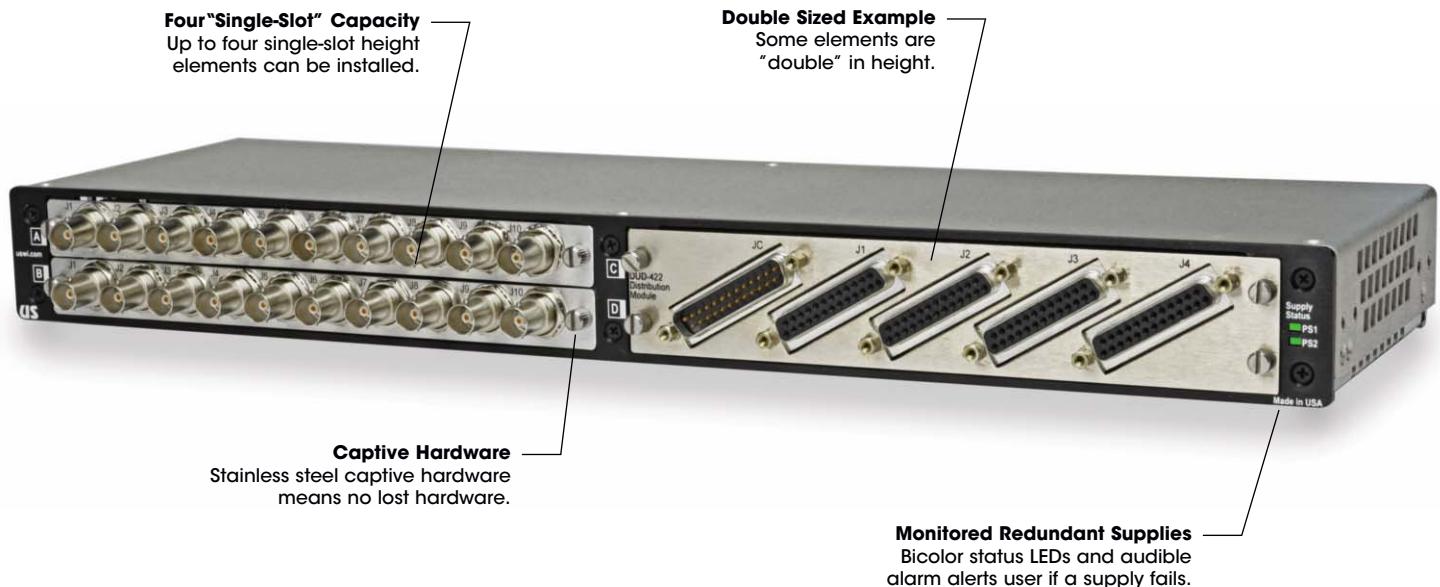
Function ..... Differential 422 1x4 distribution  
 Signal type ..... .422  
 Sections per element ..... Triple 1x2  
 Data rate ..... Up to 50Mbps  
 Signal connector ..... Twinaxial (polarized Amphenol 31-2225 type)  
 Impedance ..... .100 ohm  
 Size ..... Single slot


**W3**


### XMDU4-W3

Triple differential (422) 1x2 distribution with individual drivers, 100 ohm input termination, and polarized Twinaxial connectors.



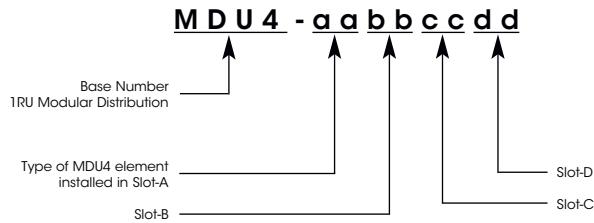


## Model Number Assignment

You can order individual elements (for example XMDU4-A2), or a complete unit with a variety of plug-in elements using the definition shown to the right. When ordering a complete unit, it comes with the MDU4-D80 chassis (with monitored dual supplies), and the elements of your choice, fully assembled, with burned-in, and fully tested with our ISO-9001 QMS.

If you need assistance, please contact your local representative or the factory.

**NOTE:** Use "00" where you don't want an element included, and a filler plate will be installed. For "double-slot" elements, specify the element in Slot-A or Slot-C and put "XX" in the "B" or "D" slot location.

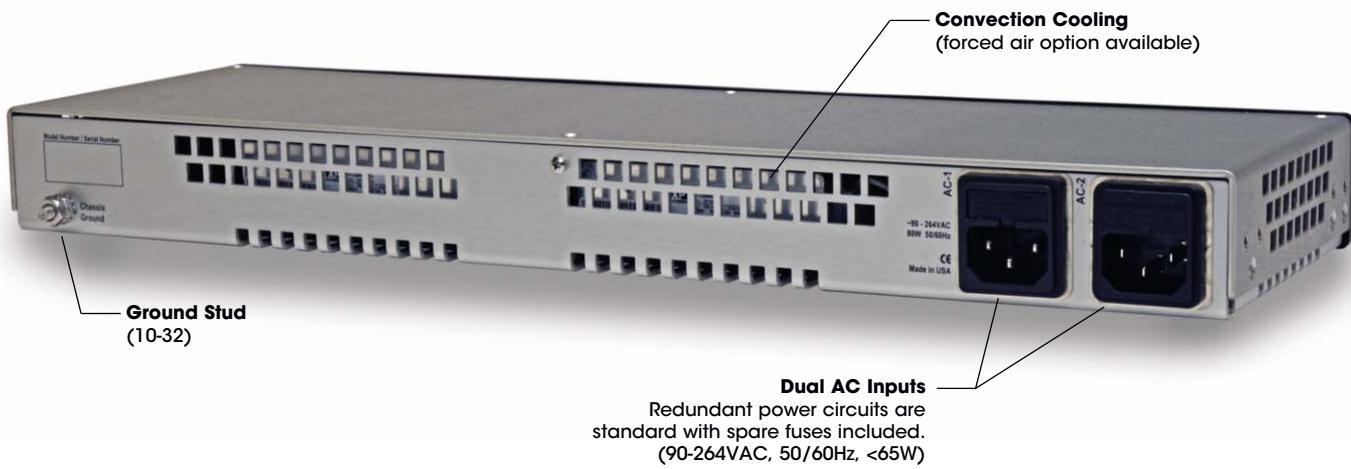


### Example 1: MDU4 - V1V10000

This specifies a complete unit with the MDU4-D80 chassis, the XMDU4-V1 type element in Slot-A and Slot-B, and filler plates in Slot-C and Slot-D.

### Example 2: MDU4 - G2F2D8XX

This specifies a complete unit with the MDU4-D80 chassis, the XMDU4-G2 element in Slot-A, XMDU4-F2 in Slot-B, and XMDU4-D8 Slot-C/D (see note).



## Spare Items

Model	Description
MDU4-D80	MDU4 chassis with redundant 80W power supplies (no elements)
PSMDU4-080	Power supply assembly: 80W
XMDU4-F	Auxiliary fan kit (application dependent)
FPMDU4-001	Filler plate for one slot
XDUD4-002	Dual power supply monitoring assembly
FPMDU4-001	Filler plate for one slot

## MDU4 Specifications

Capacity ..... Four "single-sized" elements  
 Type of system ..... Power chassis  
 Architecture ..... Modular

### General Specifications

Power supply section ..... Redundant  
 Power supply monitoring ..... Included  
 Status LED's ..... Bicolor  
 Cooling ..... Convection  
 AC power requirements ..... 90-264VAC, 50/60Hz, <80 Watts  
 AC inlets ..... Two (independent)  
 Optional DC input ..... Available (contact factory)  
 Line protection ..... Fuses @ AC inlets  
 Weight ..... <8 lbs  
 Size ..... 1.72H x 5.00D x 19.00W (1RU)  
 Operating temp ..... 0 to +60C  
 Non-operating temp ..... -20 to +85C  
 Humidity ..... 0 to 95% (NC @ +25C)  
 MTBF ..... >210,000 hours  
 Warranty ..... 2 years  
 Certifications ..... CE EN61010

Universal Switching's policy is one of continuous development. Consequently, the company reserves the right to vary from the descriptions and specifications shown in this publication.