MXS-9200 OPTICAL SWITCH

AVAILABLE EXCLUSIVELY FROM EXFO

This latest generation in the MXS optical switch series, the MXS-9200 is a laboratory-grade, high performance optical switch optimized for use with EXFO LTB solutions and with software control via SCPI over ethernet. The MXS-9200 enhanced platform utilizes DiCon Fiberoptics' industry proven MEMS optical switch technology to reliably connect fibers together in a fully automated and open loop operation.

Available with either non-blocking MxN matrix switches, or with an array of 1xN optical switches, the MXS-9200 is the industry standard for sharing centralized instruments or automated testing on multiple devices in development, qualification, and production testing.

The MXS-9200 is the successor and replacement to the popular MXS-9100.

ENHANCED MXS-9200 PLATFORM AND TOOLKIT

- Research-grade optical performance with excellent crosstalk, repeatability and stability
- High density design in many fiber types (SM, PM, MM)
- High speed SCPI over ethernet and REST API remote control
- Front panel display and controls
- Powerful WEB GUI for local control and administration
- Field serviceable software upgrade
- Dual ethernet ports for redundant network interface
- Removable control unit and power unit

AVAILABLE CONFIGURATIONS

CONFIGURATION		SWITCH SIZE		FIBER TYPE
#	TYPE	MIN	MAX	
1	MxN Matrix	2x8	192x192	Singlemode
2	MxN Matrix	2x8	32x32	SM Polarization Maintaining
3	MxN Matrix	2x8	64x64	Multimode
4	1xN Array	1x4	1x8	Singlemode
5	1xN Array	1x4	1x4	SM Polarization Maintaining
6	1xN Array	1x4	1x8	Multimode

DiCon® FIBEROPTICS

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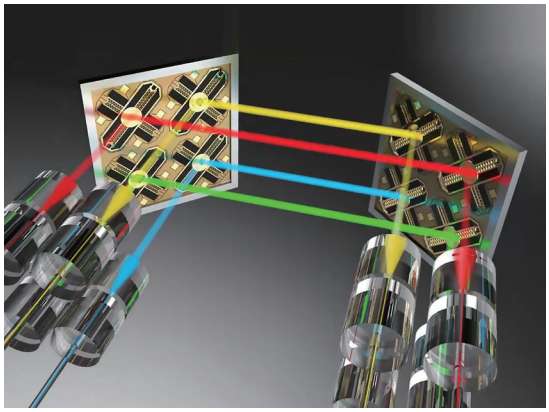
INDUSTRY LEADING MEMS TECHNOLOGY

DiCon's MEMS Matrix Switch components are produced based on DiCon's proprietary and proven MEMS tilting mirror technology. This MEMS mirror platform has been built into millions of components for the optical networking industry and comes with a 20 plus years of field deployment record. DiCon's MEMS Matrix Switches are extremely stable and can operate under open-loop conditions.
They have the best-in-the-class durability, repeatability, and optical performance, suitable for even the most demanding applications including QUANTUM communications and computing.



KEY OPTICAL SWITCHING FEATURES

High Stability and best-in-class overall performance – The optical alignment is extremely stable offering exceptional repeatability and IL stability, even when subject to typical vibrations normally associated with factory installations.

High Reliability – An open-loop design reduces design complexity with fewer components and subsystems, resulting in improved overall long-term reliability, not just on the expected number of switch cycles, but on the overall operation.

Unique multu-port-single-command switching – This time-saving feature is available through the remote-control command set and allows changing multiple ports with a single command. This offers a significant improvement in productivity, and simplifies the automation software, particularly with high port-count switches.

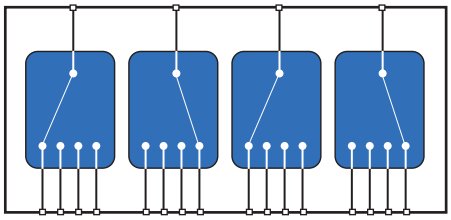
No dithering or active-alignment artifacts – With open-loop operation once the in and out ports are aligned, there is no requirement to monitor, feedback, and apply corrections to the alignment. The MXS-9200 matrix switch assures the optical alignment through a mechanically stable design along with in-house proprietary MEMS technology.

No limitations on input power levels – Since there is no active monitoring, the MXS-9200 matrix switches can reliably align even very low power levels. This is important when performing tests over a wide range of power levels, for example in transceiver sensitivity testing.

Protocol and bit rate independent – When testing optical transmission, it is important that there are no signal instabilities, dithering, and/or internal interference along the optical path. The MXS-9200 matrix switch provides a clean and stable optical path whether singlemode, polarization maintaining, or multimode configuration.

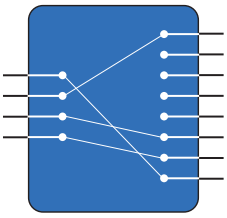
MXN MATRIX AND 1XN ARRAY CONFIGURATIONS

Depending on your application and requirements, the MXS-9200 is available with either an MXN matrix configuration, or with an Array of 1XN switches. Both matrix and 1XN are available with either Singlemode, Polarization Maintaining, or Multimode fiber.



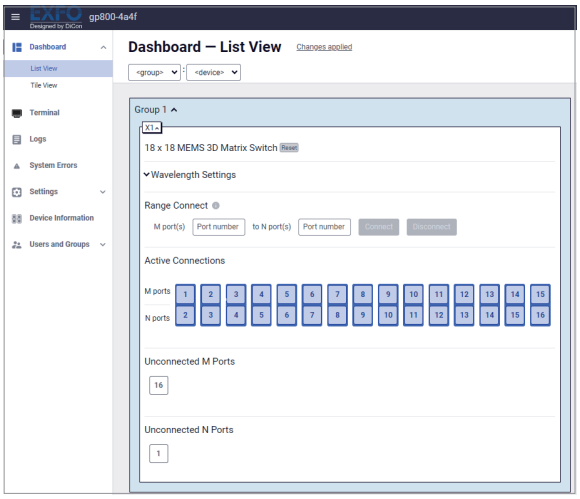
1XN ARRAY CONFIGURATION

In the 1xN array configuration, the MXS-9200 will have an array (1, 2, 4, 6, or 8) of 1XN switches. Each of the 1XN switches can be controlled independently. This option provides a convenient and compact series of high performance 1XN switches. In the diagram above the MXS-9200 is configured with a 4 X 1X4 switch array



MXN MATRIX CONFIGURATION

In the MXN matrix configuration, the MXS-9200 will have a single matrix switch with M inputs and N outputs. Any input port can be connected to any output port. This configuration is often used for testing multiple components while sharing the same testing instruments. In the diagram above, the MXS-9200 is configured with a 4x8 matrix switch



MXS-9200 WEB GUI

The convenient and powerful WEB GUI is ideal for laboratory and research work where flexible local control from any WEB browser allows full administration, sharing, and operational control. Use the WEB GUI to do all your ad-hoc testing and use the powerful remote commands for integration into your automation testing environment.

SINGLEMODE MXN MATRIX, MXS-9200 OPTICAL SWITCH

OPTICAL SPECIFICATIONS[1,2]

PARAMETER	RATING
Insertion Loss[3]	0.8 dB typical 1.4 dB max.
Stability[4,5]	0.02 dB typical 0.05 dB max.
Crosstalk	-85 dB typical -60 dB max.
Back Reflection	-55 dB typical -45 dB max.
Switching Time	15 ms typical 25 ms max.
WDL[6]	0.3 dB max. for 2x8 to 16x16 0.4 dB max. for 24x24 to 192x192
PDL	0.08 dB typical 0.1 dB max.
Repeatability[7]	0.01 dB typical 0.06 dB max.
Durability	10^9 Cycles
Optical Power	500 mW max.
Operating Temperature	0 to 50 °C
Storage Temperature	-20 to 60 °C
Relative Humidity	0% to 80% non-condensing
Fiber Type	9/125 um singlemode
Operating Wavelength Range	1240 - 1680 nm

1. Specifications referenced without connectors at 23 ± 5 °C.
   Add 0.4 dB for connector loss.
2. Specifications valid when wavelength is set to the wavelength range in use (O, C, L or U band).
   Note: Each wavelength band has its own wavelength band index, which can be set to optimize the optical performance for that band. Only one wavelength band index can be selected at a time. The provided wavelength band index will be 1310nm, 1550nm & 1625nm for the full band version. Set a nearby wavelength band index to have the best performance if the selected band has no wavelength band index.
3. Insertion Loss (IL) specification is defined at 1550 nm (C band).
   Operation at 1310 nm (O band) adds 0.1 dB typical, 0.2 dB max.
   Operation at 1590 nm (L band) adds 0.1 dB typical, 0.2 dB max.
   Operation at 1625 nm (U band) adds 0.2 dB typical, 0.4 dB max.
4. Stability is defined as the difference between highest and lowest insertion loss for a given connection, over a given period.
5. Defined over 10 second period using 10 kHz sample rate.
6. WDL is measured in a +/- 20 nm range centered at the set wavelength (1310, 1550, 1590 or 1625 nm). Operation in U band adds 0.1 dB to the max.
7. Repeatability is defined within 100 cycles.

ELECTRICAL SPECIFICATIONS

PARAMETER	RATING
Latching Type	Non-latching
Control Type	Ethernet Interface with SCPI Command Set and REST API
Supply Voltage	AC 100 - 240 V, 50/60 Hz

ORDERING INFORMATION

MXS - 9200 - ☐ - ☐ - B - ☐

Product Code

MXS-9200

Configuration

2-8	2 inputs and 8 outputs
2-16	2 inputs and 16 outputs
4-4	4 inputs and 4 outputs
4-8	4 inputs and 8 outputs
4-12	4 inputs and 12 outputs
4-16	4 inputs and 16 outputs
8-8	8 inputs and 8 outputs
8-16	8 inputs and 16 outputs
16-16	16 inputs and 16 outputs
24-24	24 inputs and 24 outputs
32-32	32 inputs and 32 outputs
48-48	48 inputs and 48 outputs
64-64	64 inputs and 64 outputs
96-96	96 inputs and 96 outputs
192-192	192 inputs and 192 outputs

Other configurations available upon request.

Fiber Type

B	9/125 um singlemode

Connector Type

58	FC/APC connectors
89	FC/UPC connectors
104	LC/APC connectors
101	LC/UPC connectors
88	SC/APC connectors
91	SC/UPC connectors

CHASSIS SIZE

SWITCH SIZE	FC	SC	LC
2x8	1U	1U	1U
2x16	1U	1U	1U
4x4	1U	1U	1U
4x8	1U	1U	1U
4x12	1U	1U	1U
4x16	1U	1U	1U
8x8	1U	1U	1U
8x16	1U	1U	1U
16x16	1U	1U	1U
24x24	2U	1U	1U
32x32	2U	2U	1U
48x48	2U	2U	2U
64x64	3U	3U	2U
96x96	4U	3U	2U
192x192	8U	6U	4U

PM MXN MATRIX, MXS-9200 OPTICAL SWITCH

OPTICAL SPECIFICATIONS[1,2]

PARAMETER	RATING
Insertion Loss[3]	0.8 dB typical 1.4 dB max
Stability[4,5]	0.02 dB typical 0.05 dB max.
Crosstalk	-85 dB typical -60 dB max.
Back Reflection	-55 dB typical -45 dB max.
Switching Time	15 ms typical 25 ms max.
WDL[6]	0.3 dB max.
PER[7]	22 dB typical 18 dB min.
Repeatability[8]	0.01 dB typical 0.06 dB max.
Durability	10^9 Cycles
Optical Power	500 mW max.
Operating Temperature	0 to 50 °C
Storage Temperature	-20 to 60 °C
Relative Humidity	0% to 80% non-condensing
Fiber Type	Polarization Maintaining
Operating Wavelength Range	1240 - 1680 nm

1. Specifications referenced without connectors at 23 ± 5 °C. Add 0.4 dB for connector loss.
2. Specifications valid when wavelength is set to the wavelength range in use (O, C, L or U band).
   Note: Each wavelength band has its own wavelength band index, which can be set to optimize the optical performance for that band. Only one wavelength band index can be selected at a time. The provided wavelength band index will be 1310nm, 1550nm & 1625nm for the full band version. Set a nearby wavelength band index to have the best performance if the selected band has no wavelength band index.
3. Insertion Loss (IL) specification is defined at 1550 nm (C band).
   Operation at 1310 nm (O band) adds 0.1 dB typical, 0.2 dB max.
   Operation at 1590 nm (L band) adds 0.1 dB typical, 0.2 dB max.
   Operation at 1625 nm (U band) adds 0.2 dB typical, 0.4 dB max.
4. Stability is defined as the difference between highest and lowest insertion loss for a given connection, over a given period.
5. Defined over 10 second period using 10 kHz sample rate.
6. WDL is measured in a +/- 20 nm range centered at the set wavelength (1310, 1550, 1590 or 1625 nm). Operation in U band adds 0.1 dB to the max.
7. PER 14dB with connector.
8. Repeatability is defined within 100 cycles.

ELECTRICAL SPECIFICATIONS

PARAMETER	RATING
Latching Type	Non-latching
Control Type	Ethernet Interface with SCPI Command Set and REST API
Supply Voltage	AC 100 - 240 V, 50/60 Hz

ORDERING INFORMATION

MXS - 9200 - ☐ - ☐ - ☐ - ☐

Product Code

MXS-9200

Configuration

2-8	2 inputs and 8 outputs
2-16	2 inputs and 16 outputs
2-32	2 inputs and 32 outputs
4-8	4 inputs and 8 outputs
4-16	4 inputs and 16 outputs
4-32	4 inputs and 32 outputs
8-8	8 inputs and 8 outputs
16-16	16 inputs and 16 outputs
16-32	16 inputs and 32 outputs
32-32	32 inputs and 32 outputs

Other configurations available upon request.

Fiber Type

PM13[1]	PM13 fiber
PM15[2]	PM15 fiber

1. PER specification covers 1270nm to 1510nm
2. PER specification covers 1440nm to 1640nm

Connector Type[3]

58	FC/APC connectors
89	FC/UPC connectors
104	LC/APC connectors
101	LC/UPC connectors
88	SC/APC connectors
91	SC/UPC connectors

3. Connector key orientation is default to be slow axis.

CHASSIS SIZE

SWITCH SIZE	FC	SC	LC
2x8	1U	1U	1U
2x16	1U	1U	1U
2x32	1U	1U	1U
4x8	1U	1U	1U
4x16	1U	1U	1U
4x32	1U	1U	1U
8x8	1U	1U	1U
16x16	1U	1U	1U
16x32	2U	2U	1U
32x32	2U	2U	1U

MULTIMODE MXN MATRIX, MXS-9200 OPTICAL SWITCH

OPTICAL SPECIFICATIONS[1,2]

PARAMETER	RATING
Insertion Loss[3]	0.8 dB typical 1.4 dB max
Stability[4,5]	0.02 dB typical 0.05 dB max.
Crosstalk[6]	-70 dB typical -65 dB max.
Back Reflection	-25 dB typical -20 dB max.
Switching Time	15 ms typical 25 ms max.
Repeatability[7]	0.01 dB typical 0.06 dB max.
Durability	10^9 Cycles
Optical Power	500 mW max.
Operating Temperature	0 to 50 °C
Storage Temperature	-20 to 60 °C
Relative Humidity	0% to 80% non-condensing
Fiber Type	50/125 um multimode
Operating Wavelength Range	850 & 1310 nm

1. Specifications referenced without connectors at 23 ± 5 °C. Add 0.4 dB for connector loss.
2. Specifications valid when wavelength is set to the wavelength band.
3. IL is measured with a reference mode condition, CPR=15 dB.
4. Stability is defined as the difference between highest and lowest insertion loss for a given connection, over a given period.
5. Defined over 10 second period using 10 kHz sample rate.
6. Optical off state isolation is the same as the crosstalk specification.
7. Repeatability is defined within 100 cycles.

ELECTRICAL SPECIFICATIONS

PARAMETER	RATING
Latching Type	Non-latching
Control Type	Ethernet Interface with SCPI Command Set and REST API
Supply Voltage	AC 100 - 240 V, 50/60 Hz

ORDERING INFORMATION

MXS - 9200 - ☐ - ☐ - C - ☐

Product Code

MXS-9200

Configuration

2-8	2 inputs and 8 outputs
2-16	2 inputs and 16 outputs
2-32	2 inputs and 32 outputs
4-8	4 inputs and 8 outputs
4-32	4 inputs and 32 outputs
16-16	16 inputs and 16 outputs
16-32	16 inputs and 32 outputs
32-32	32 inputs and 32 outputs
64-64	64 inputs and 64 outputs

Other configurations available upon request.

Fiber Type

C	50/125 um multimode

Connector Type

50	FC connectors
54	SC connectors

CHASSIS SIZE

SWITCH SIZE	FC	SC	LC
2x8	1U	1U	1U
2x16	1U	1U	1U
2x32	1U	1U	1U
4x8	1U	1U	1U
4x32	1U	1U	1U
16x16	1U	1U	1U
16x32	2U	2U	1U
32x32	2U	2U	1U
64x64	3U	3U	2U

SINGLEMODE 1XN ARRAY, MXS-9200 OPTICAL SWITCH

OPTICAL SPECIFICATIONS[1]

PARAMETER	RATING
Insertion Loss[2]	0.7 dB max
Crosstalk	-50 dB max.
Back Reflection	-50 dB max.
Switching Time	30 ms max.
WDL[3]	0.5 dB max.
PDL	0.15 dB max.
Repeatability[4]	0.02 dB max.
Durability	10^9 Cycles
Optical Power	500 mW max.
Operating Temperature	0 to 50 °C
Storage Temperature	-20 to 60 °C
Relative Humidity	0% to 80% non-condensing
Fiber Type	9/125 um singlemode
Operating Wavelength Range	1240 - 1680 nm

1. Specifications referenced without connectors at 23 ± 5 °C.
   Add 0.4 dB for connector loss.
   Note: Each wavelength band has its own wavelength band index, which can be set to optimize the optical performance for that band. Only one wavelength band index can be selected at a time. The provided wavelength band index will be 1310nm, 1550nm & 1625nm for the full band version. Set a nearby wavelength band index to have the best performance if the selected band has no wavelength band index.
2. Insertion Loss (IL) specification is defined at 1550 nm & 1625 nm.
   Operation at 1310 nm adds 0.2 dB max.
3. WDL is defined within a wavelength band, and is measured over 1290 - 1330 nm, 1530 - 1570 nm, and 1605 - 1641 nm.
4. Repeatability is defined within 100 cycles.

ORDERING INFORMATION

MXS - 920☐ - 01 - ☐ - B - ☐

Product Code

MXS-9201	1 switch per system
MXS-9202	2 switches per system
MXS-9204	4 switches per system
MXS-9206	6 switches per system
MXS-9208	8 switches per system

Configuration

01-04	1x4 optical switch
01-08	1x8 optical switch

Fiber Type

B	9/125 um singlemode

Connector Type

58	FC/APC connectors
89	FC/UPC connectors
104	LC/APC connectors
101	LC/UPC connectors
88	SC/APC connectors
91	SC/UPC connectors

ELECTRICAL SPECIFICATIONS

PARAMETER	RATING
Latching Type	Non-latching
Control Type	Ethernet Interface with SCPI Command Set and REST API
Supply Voltage	AC 100 - 240 V, 50/60 Hz

CHASSIS SIZE

NUMBER OF SWITCHES	1x4			1x8		
	FC/APC FC/UPC	LC/APC LC/UPC	SC/APC SC/UPC	FC/APC FC/UPC	LC/APC LC/UPC	SC/APC SC/UPC
1	1U	1U	1U	1U	1U	1U
2	1U	1U	1U	1U	1U	1U
4	1U	1U	1U	1U	1U	1U
6	1U	1U	1U	2U	1U	2U
8	1U	1U	1U	2U	1U	2U

PM 1X4 ARRAY, MXS-9200 OPTICAL SWITCH

OPTICAL SPECIFICATIONS[1]

PARAMETER	RATING
Insertion Loss[2]	0.7 dB max
Crosstalk	-50 dB max.
Back Reflection	-50 dB max.
Switching Time	30 ms max.
WDL[3]	0.5 dB max.
PER[4]	18 dB min.
Repeatability[5]	0.02 dB max.
Durability	10^9 Cycles
Optical Power	500 mW max.
Operating Temperature	0 to 50 °C
Storage Temperature	-20 to 60 °C
Relative Humidity	0% to 80% non-condensing
Fiber Type	Polarization Maintaining
Operating Wavelength Range	1240 - 1680 nm

1. Specifications referenced without connectors at 23 ± 5 °C. Add 0.4 dB for connector loss.
   Note: Each wavelength band has its own wavelength band index, which can be set to optimize the optical performance for that band. Only one wavelength band index can be selected at a time. The provided wavelength band index will be 1310nm, 1550nm & 1625nm for the full band version. Set a nearby wavelength band index to have the best performance if the selected band has no wavelength band index.
2. Insertion Loss (IL) specification is defined at 1550 nm & 1625 nm. Operation at 1310 nm adds 0.2 dB max.
3. WDL is defined within a wavelength band, and is measured over 1290 - 1330 nm, 1530 - 1570 nm, and 1605 - 1641 nm.
4. PER 14dB with connector.
5. Repeatability is defined within 100 cycles.

ORDERING INFORMATION

MXS - 920 ☐ - 01 - 04 - ☐ - ☐

Product Code

MXS-9201	1 switch per system
MXS-9202	2 switches per system
MXS-9204	4 switches per system

Configuration

01-04	1x4 optical switch

Fiber Type

PM13[1]	PM13 fiber
PM15[2]	PM15 fiber

1. PER specification covers 1270nm to 1510nm
2. PER specification covers 1440nm to 1640nm

Connector Type[1]

58	FC/APC connectors
89	FC/UPC connectors
104	LC/APC connectors
101	LC/UPC connectors
88	SC/APC connectors
91	SC/UPC connectors

1. Connector key orientation is default to be slow axis.

ELECTRICAL SPECIFICATIONS

PARAMETER	RATING
Latching Type	Non-latching
Control Type	Ethernet Interface with SCPI Command Set and REST API
Supply Voltage	AC 100 - 240 V, 50/60 Hz

CHASSIS SIZE

NUMBER OF SWITCHES	1x4		
	FC/APC FC/UPC	LC/APC LC/UPC	SC/APC SC/UPC
1	1U	1U	1U
2	1U	1U	1U
4	1U	1U	1U

MULTIMODE 1XN ARRAY, MXS-9200 OPTICAL SWITCH

OPTICAL SPECIFICATIONS[1,2]

PARAMETER		RATING
Insertion Loss[3]	1x4	1.0 dB max.
	1x8	1.0 dB max.
	1x12	1.2 dB max.
Crosstalk[4]	50 um	-25 dB max.
	62.5 um	-20 dB max.
Back Reflection		-20 dB max.
Switching Time		30 ms max.
Repeatability[5]		0.02 dB max.
Durability		10^9 Cycles
Optical Power		500 mW max.
Operating Temperature		0 to 50 °C
Storage Temperature		-20 to 60 °C
Relative Humidity		0% to 80% non-condensing
Fiber Type		50/125 um multimode, or 62.5/125 um multimode
Operating Wavelength Range		850 & 1310 nm

1. Specifications referenced without connectors at 23 ± 5 °C. Add 0.4 dB for connector loss.
2. Specifications valid when wavelength is set to the wavelength band.
3. IL is measured with a reference mode condition, CPR=15 dB.
4. Optical off state isolation is the same as the crosstalk specification.
5. Repeatability is defined within 100 cycles.

ORDERING INFORMATION

MXS - 920 ☐ - 01 - ☐ - ☐ - ☐

Product Code

MXS-9201	1 switch per system
MXS-9202	2 switches per system
MXS-9204	4 switches per system
MXS-9206	6 switches per system
MXS-9208	8 switches per system

Configuration

01-04	1x4 optical switch
01-08	1x8 optical switch

Fiber Type

C	50/125 um multimode
D	62.5/125 um multimode

Connector Type

50	FC connectors
54	SC connectors

ELECTRICAL SPECIFICATIONS

PARAMETER	RATING
Latching Type	Non-latching
Control Type	Ethernet Interface with SCPI Command Set and REST API
Supply Voltage	AC 100 - 240 V, 50/60 Hz

CHASSIS SIZE

# OF SWITCHES	1x4		1x8	
	FC	SC	FC	SC
1	1U	1U	1U	1U
2	1U	1U	1U	1U
4	1U	1U	1U	1U
6	1U	1U	2U	2U
8	1U	1U	2U	2U

MECHANICAL SPECIFICATIONS

CHASSIS SIZE	HEIGHT		WIDTH		DEPTH	
	MM	IN	MM	IN	MM	IN
1U	44	1.7	483	19	435	17.1
2U	88	3.5	483	19	435	17.1
3U	133	5.2	483	19	435	17.1
4U	177	7.0	483	19	435	17.1
5U	222	8.7	483	19	435	17.1
6U	266	10.5	483	19	435	17.1
8U	355	14.0	483	19	435	17.1