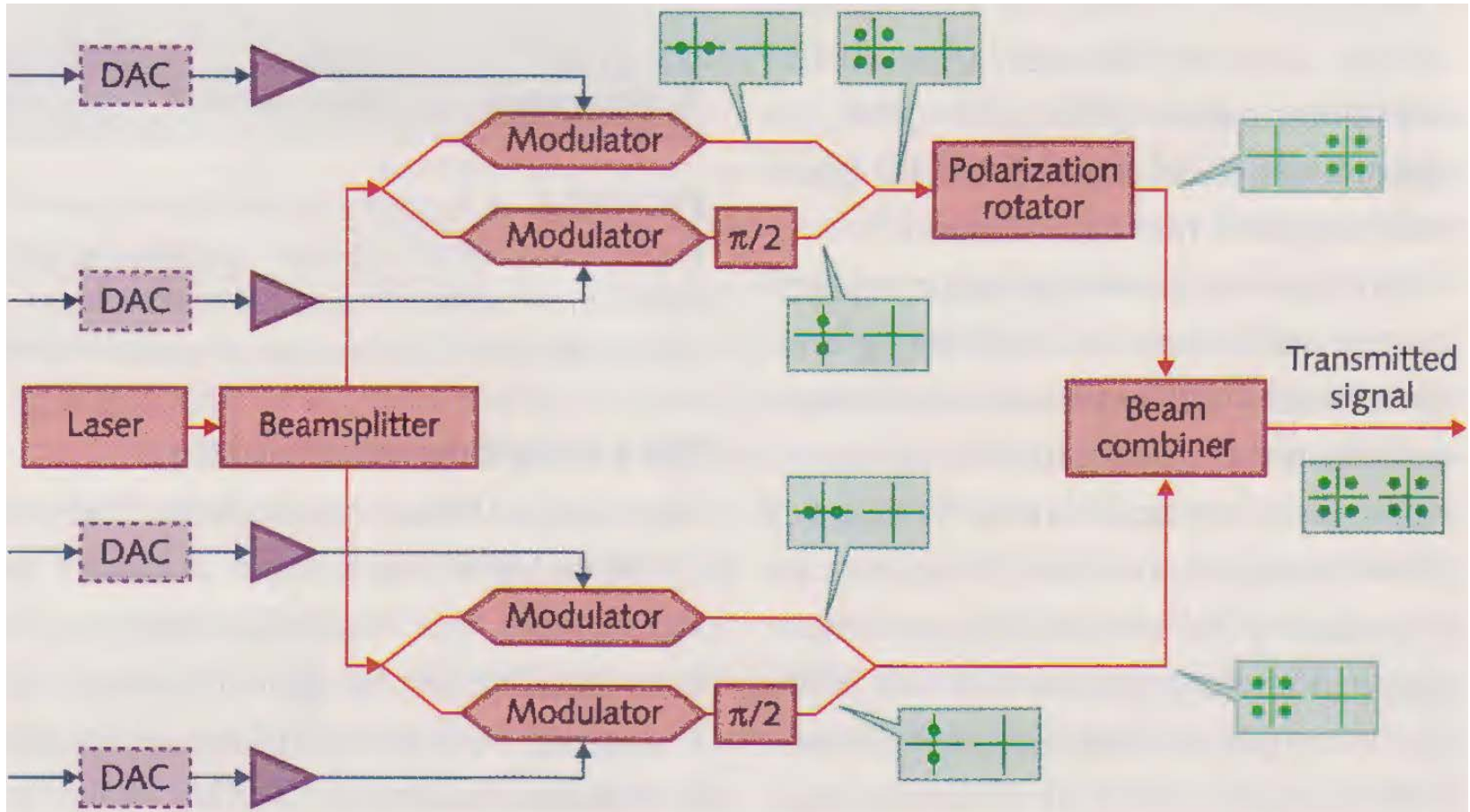


A DP-QPSK Transmitter

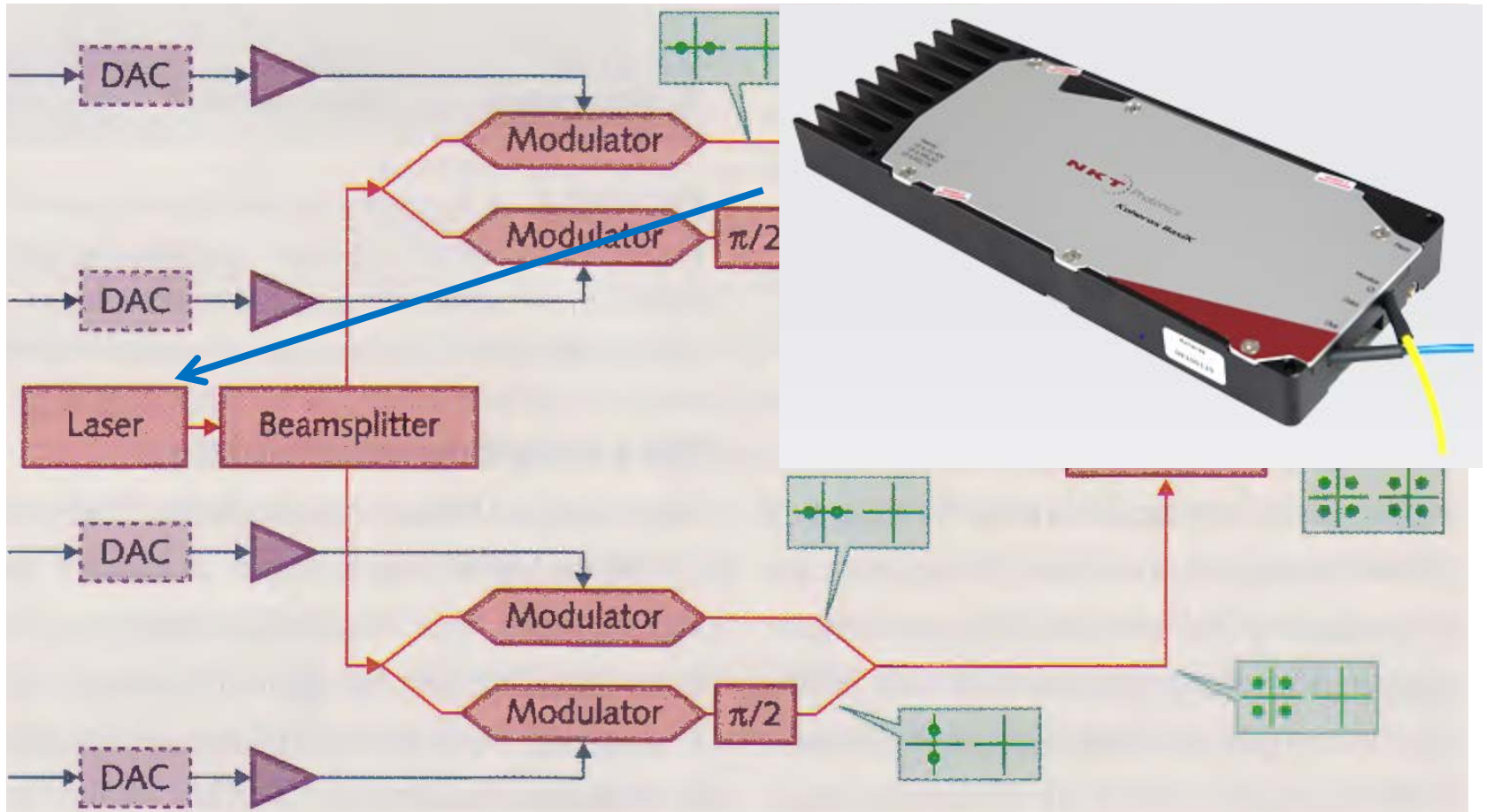


From "Multilevel Modulation Formats Push Capacities Beyond 100 Gbits/sec," Shubhashish, Data, and Crawford, In Laser Focus World, February, 2012, pp. 58-63.

Parts for a DP-QPSK Transmitter

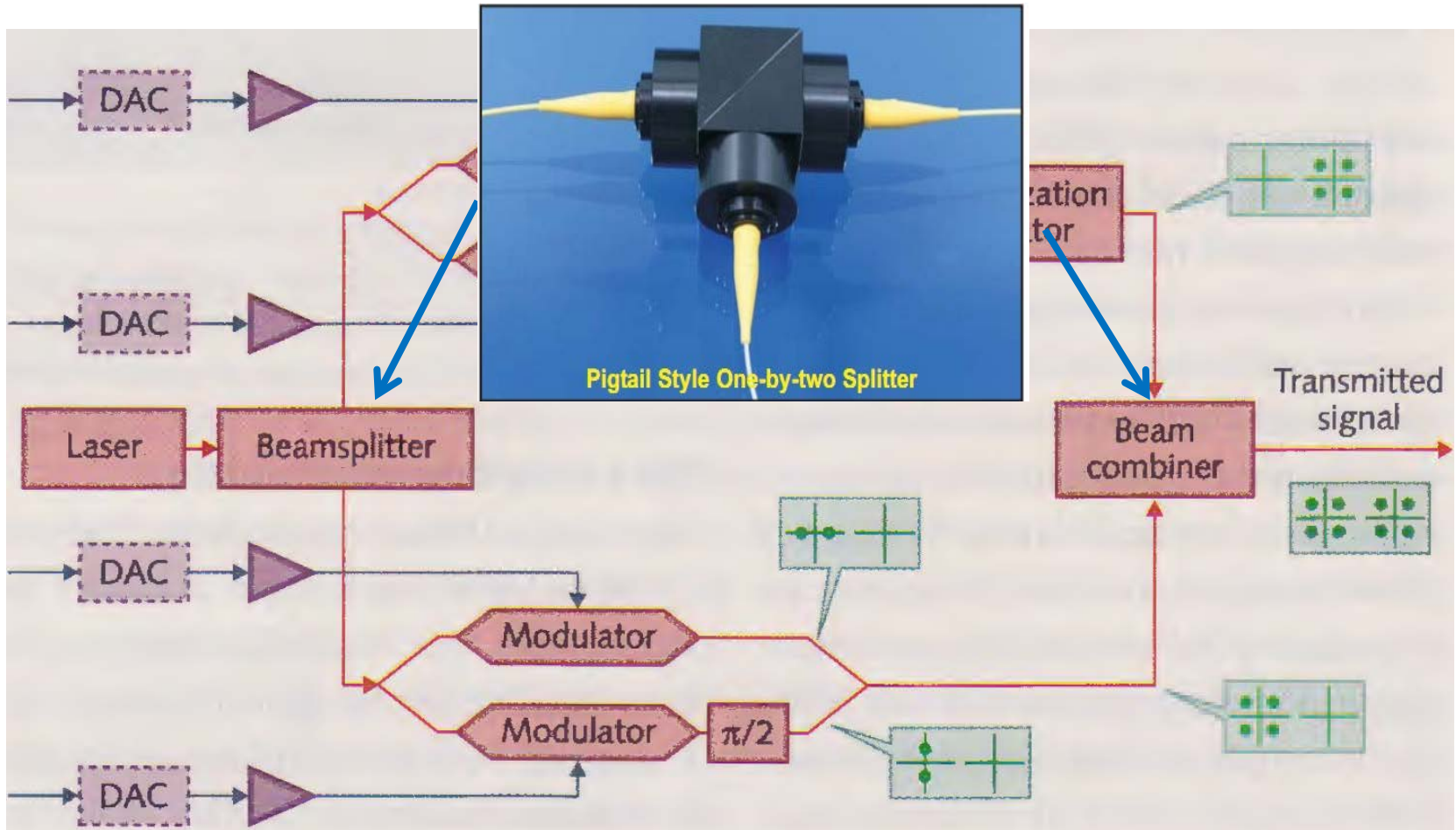
Component	Manufacturer	Model Number	Wavelength Range (nm)	Insertion Loss (dB)	Polarization Maintaining (Yes/No)	Price (\$)	Comments
CW Laser	NKT Photonics	Koheras Basik E15	1535-1585 nm	(16 dBm output)	Yes	11K	Mehravar: Piezo tuning capability, needs power supply, up to 40 mW, < 0.1kHz,
Beam splitters/combiners	OZ OPTICS	FOBS-22P-1111-8/125-PPPP-1550-50/50-60-3A3A3A3A-1	1520-1570	0.6	Yes	695	Mo: Wide wavelength range, Bi-dirctional, High extinction ratio, Mode independent behavior in multimode fiber applications.
Phase modulator	Thorlabs	LN65S-FC-10 GHz	1520 nm-1620nm	4 dB	YES	1550	Kogo: 10 GHz Phase Modulator with polarizer FC/PC Connectors
Polarization Rotator	ARCOptix	PR5600	350 - 1700nm	~2.0 @ 1550nm, ~0.7 in VIS	N/A	1030	Carpenter: Not ideal in the 1550nm range. I found another product with <1.5 Insertion loss at 1550nm from AC Photonics, however, it didn't offer a price point.
Fiber Optic Collimator	Go4Fiber	GPMC-15-05-A-G-M-C-10-FC	1550nm (+/-30nm range)	0.25dB Max	Yes	156	Hildinger: The linked datasheet shows how to pick a part number for a desired specification. I believe we want GPMC-15-05-A-G-M-C-10-FC http://www.go4fiber.com/spec/GPMC-XX-XX-X-X-X-XX-XX.pdf
Polarizing Beamsplitter Cubes	Thorlabs	PBS204	1200nm-1600nm	-0.15dB (98.5% over)	Yes	188	Zhang:
Polarization Maintaining Assemblies	<i>Silicon Lightwave Technology Inc</i>	SM-405-F1F2-03-1	Wavelengths: 375-980 and IR 1310-1550 nm	≤0.25 dB	Yes	\$15.50/meter	Osman: Offers low attenuation and excellent birefringence
DP-QPSK Single drive MZM Optical modulator 31 Gbaud/sec	FUJITSU	FTM7977HQA	[1528-1565](C-BAND) & [1565-1612] (L BAND)	13 dB band C and L	YES	10000	Albana/Lemieux: This is a complete modulator as oppose to single component of the modulator to be built. We should use this info to compare with what we are building in class . Potentially it can achieve up to 120 Gb/s which is even better than whats available in the industry. more info at http://jp.fujitsu.com/group/foc/downloads/services/100gln/ln100gdpqpsk-e-111102.pdf

CW Laser



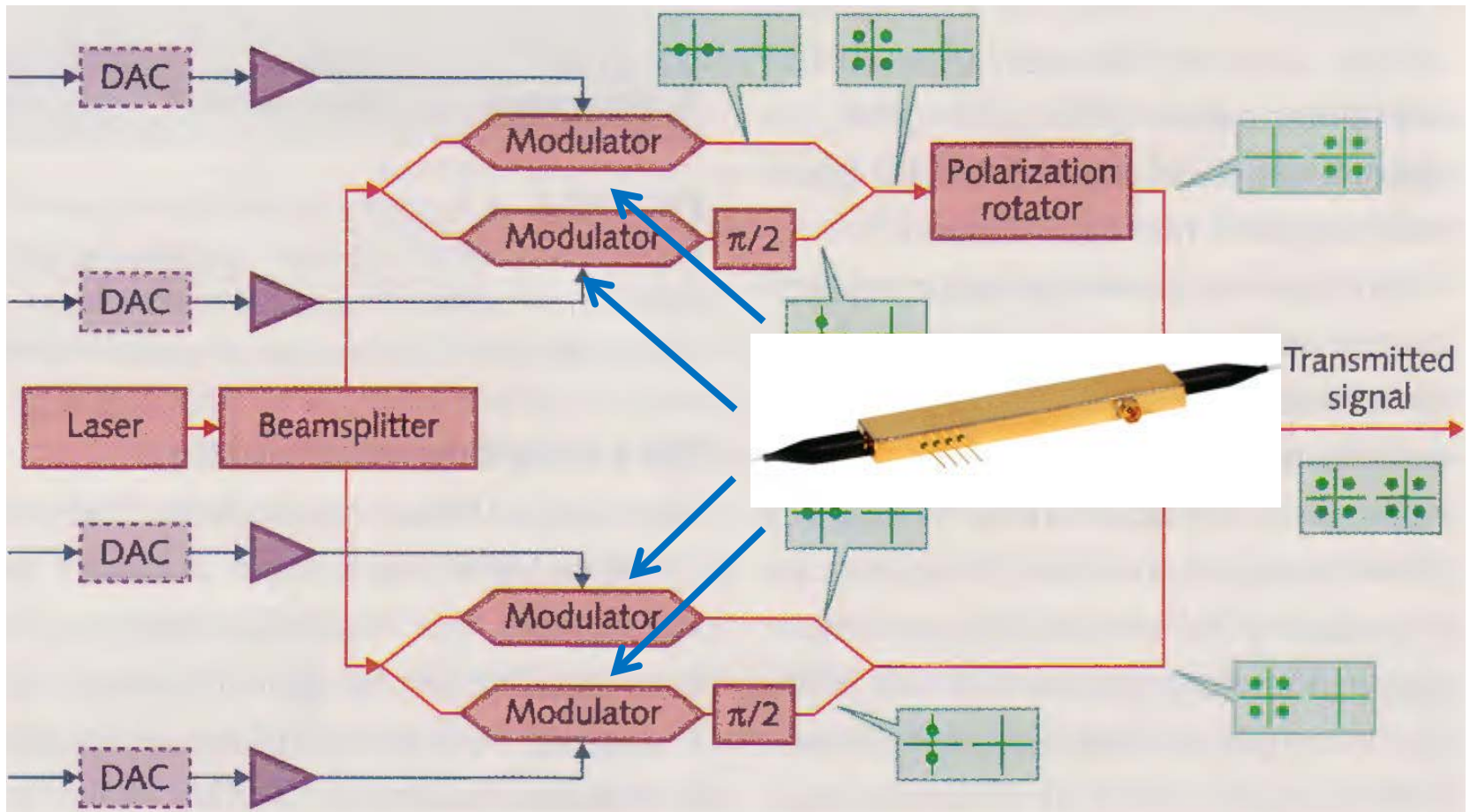
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Polarizing Beam Splitter



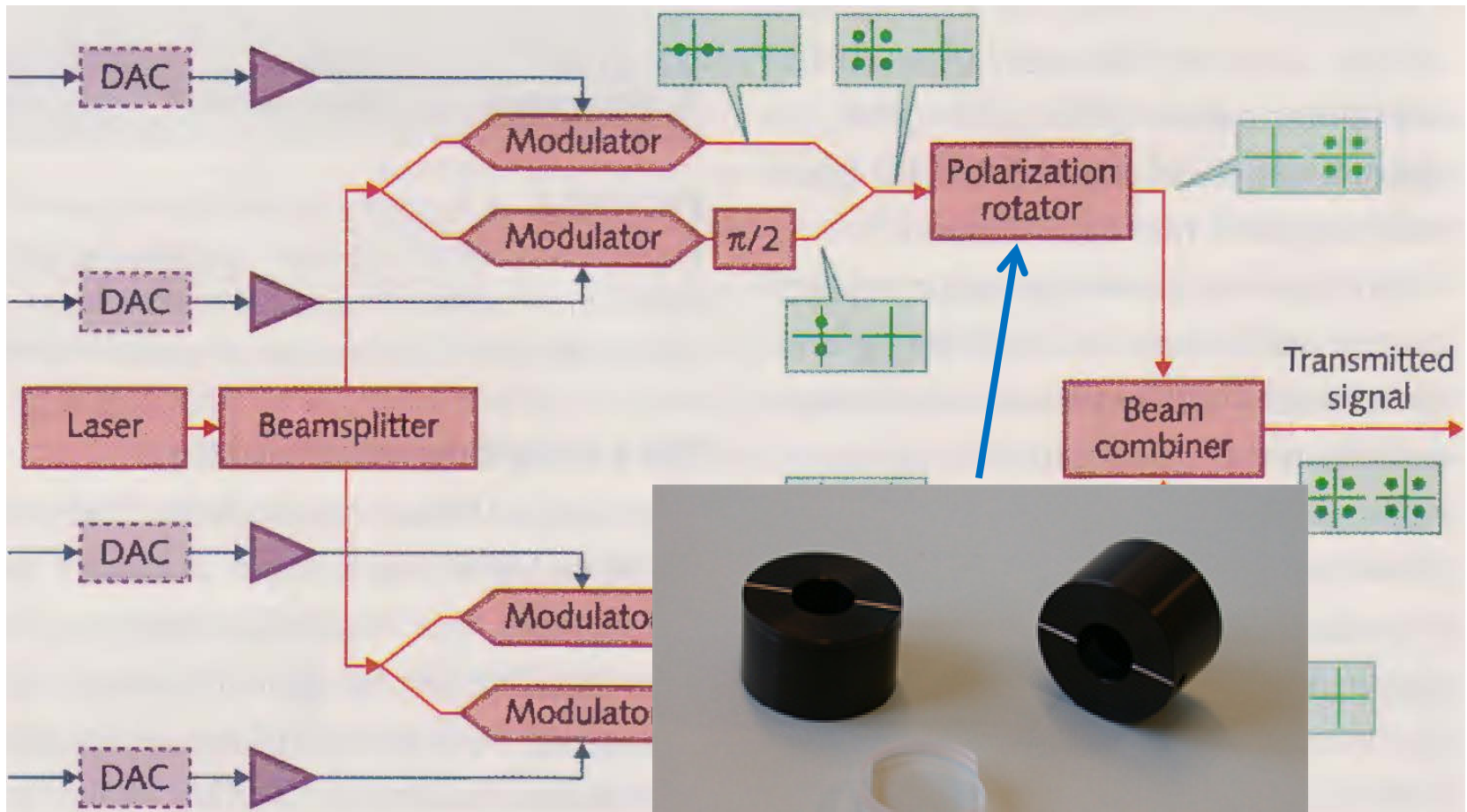
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Optical Phase Modulator



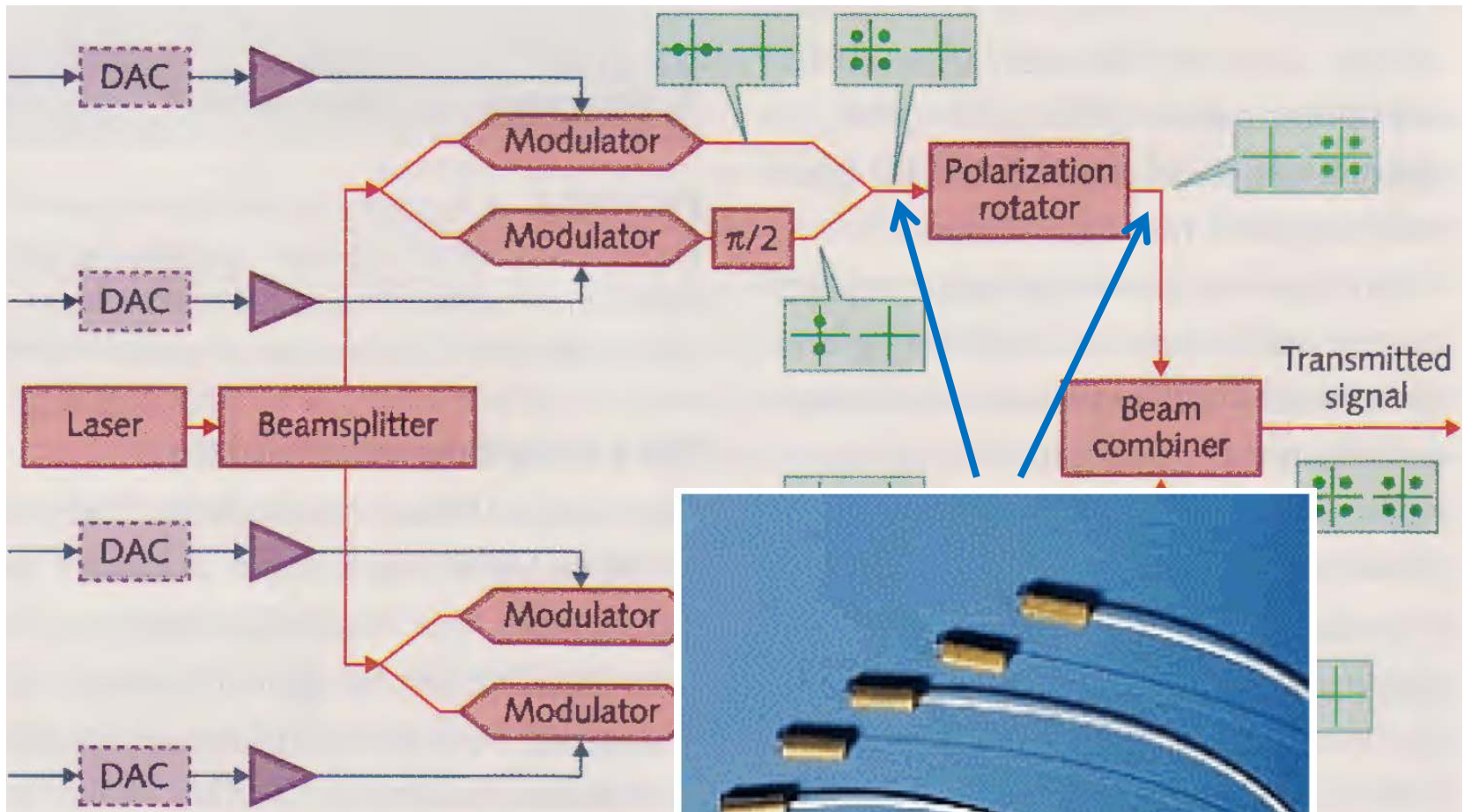
From "Multilevel Modulation Formats Push Capacities Beyond 100 Gbits/sec," Shubhashish, Data, and Crawford, In Laser Focus World, February, 2012, pp. 58-63.

Polarization Rotator – Free Space



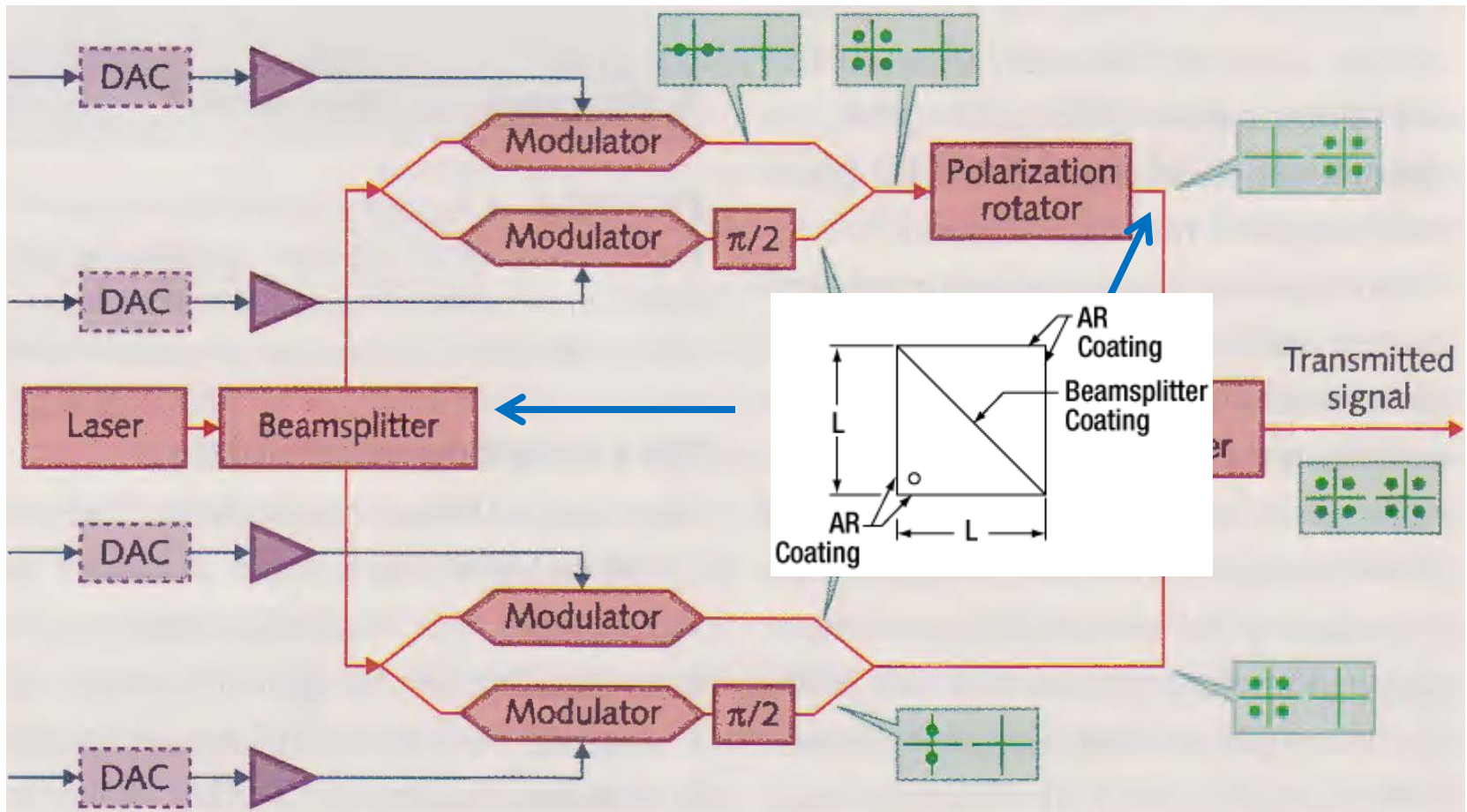
From "Multilevel Modulation Formats Push Capacity Limits"
In Laser Focus World, February, 2012, pp. 58-63.

Optical Collimators



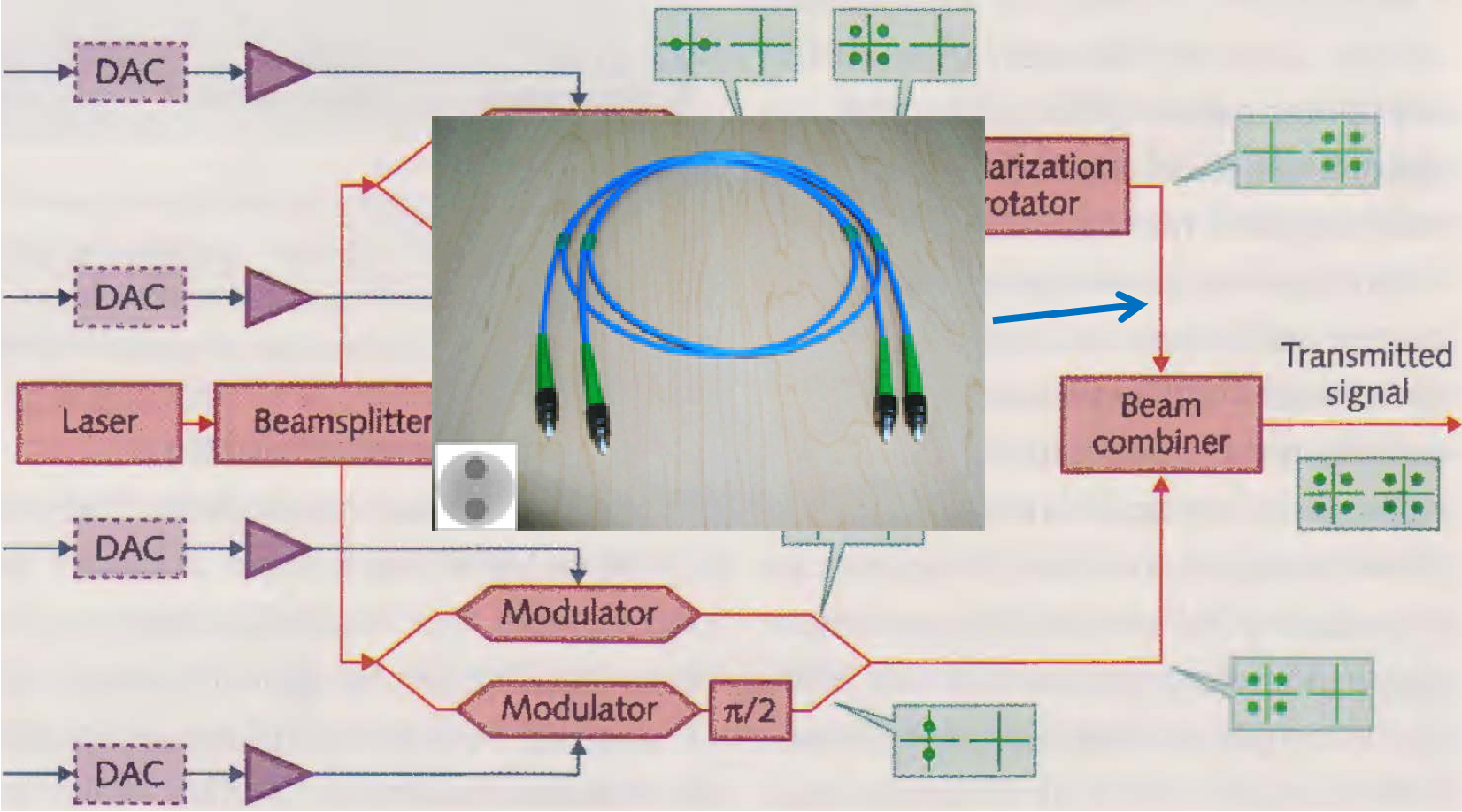
From "Multilevel Modulation Formats Push Capacity" In Laser Focus World, February, 2012, pp. 58-63.

Polarizing Beam Splitter – Free Space



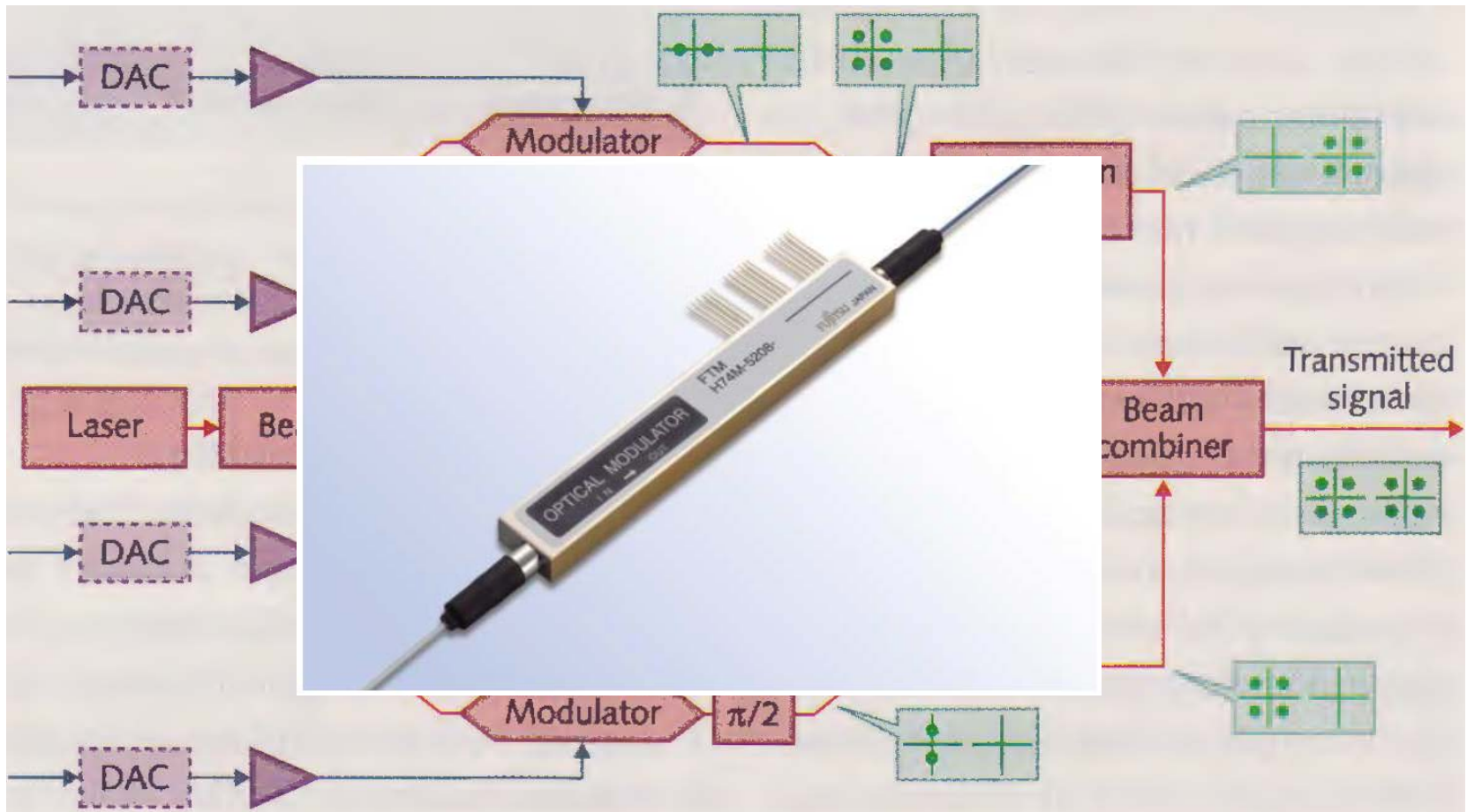
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Polarizing Maintaining Patch Cords



From "Multilevel Modulation Formats Push Capacities Beyond 100 Gbits/sec," Shubhashish, Data, and Crawford, In Laser Focus World, February, 2012, pp. 58-63.

Complete DP-QPSK Transmitter



From "Multilevel Modulation Formats Push Capacities Beyond 100 Gbits/sec," Shubhashish, Data, and Crawford, In Laser Focus World, February, 2012, pp. 58-63.