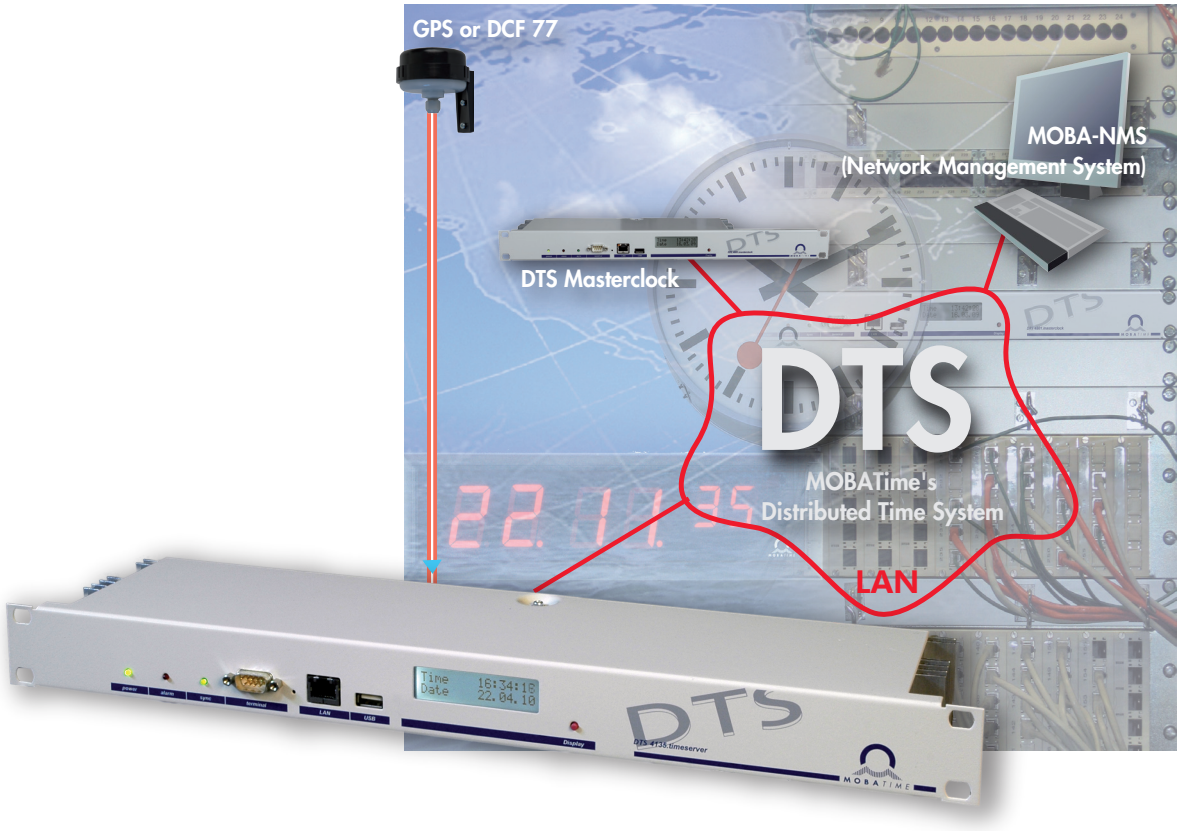


The multipurpose time server in the new LAN and NTP-based Distributed Time System by MOBATIME

DTS 4135.timeserver

The DTS 4135.timeserver sets new standards as a time reference for all NTP clients in medium and large networks (LAN Ethernet/IP/UDP). It is highly precise and with its intelligent concept for redundant operation, it offers a high degree of reliability and availability.

The DTS 4135.timeserver can either be synchronized from a time signal receiver (DCF 4500, GPS 4500 or IRIG/AFNOR time source), or from another NTP or SNTP time server in the LAN or Internet. The DTS 4135 can synchronize all slave clocks with NTP movements, either with NTP Multicast or NTP Unicast (both with time zone server function).

As a multipurpose device the time server is equipped with two independent IRIG/AFNOR outputs, two serial RS 232/RS 485 interfaces with script file programmable telegrams, two DCF or high accurate pulse /frequency outputs (RS 422 and optocoupler) and one additional DCF current loop output.

The highest degree of system availability and reliability can be achieved by the master-slave operation of two DTS 4135.timeservers connected via fiber-optic (redundant operation).

Alarms are signaled by alarm relay, SNMP messages or e-mails.

DTS 4135 - the innovative, precise time reference for networked, multifunctional systems

Time precision

Best accuracy can be achieved by synchronizing the DTS 4135.timeserver via a connected GPS receiver, and thanks to an intelligent time management. The internal time is adjusted to the time reference (e.g. GPS) in one step or slowly shifted (in adjustable micro steps) to avoid any time leaps (e.g. after a longer loss of the time source). To achieve utmost accuracy, the quartz drift and aging is continuously compensated.

Top performance - even for large networks

The high performance DTS 4135 timeserver can reply more than 250 NTP and SNTP requests per second. It can also work as an NTP time reference for a network, being synchronized from a superior NTP-Server (client and server at the same time).

NTP authentication

Supports NTP authentication for increased security, which allows the clients, to verify the received NTP packets.

Safe and convenient operation

After configuring an IP address via serial interface (terminal program), operation over LAN via MOBA-NMS (SNMP), Telnet, SSH or SNMP protocols is possible. SSH and SNMP (MD5 authentication and DES for encryption) enable a secured connection. Special software is required for operation by SNMP protocol.

Effective fault indication

Alarms are reported by alarm relay, by e-mail, or via SNMP messages. Additionally, the display can be used to check the alarm state by pressing the red push button.



Front view

Connectors:

- LAN connector RJ 45, 10/100 Mbit
- PC terminal connector, RS232 Sub-D 9p male
- USB connector for software update, file download to the DTS 4135 (e.g. telegram files, time-zone table, etc.) and maintenance

LEDs: Mains power, alarm, synchronization and network transmission control

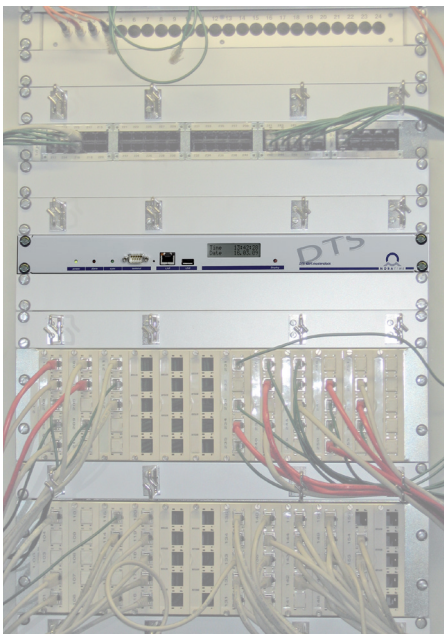
Display: Time, date, status, alarm, IP, etc.



Rear view

Connectors:

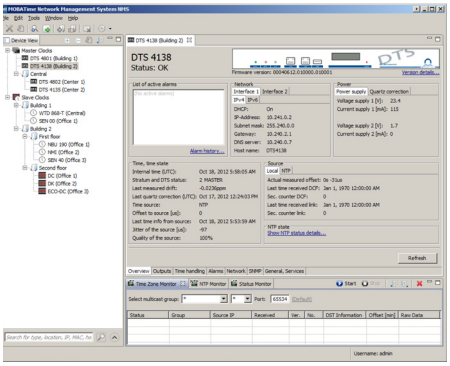
- Power: Mains power connector, 2 DC power supply inputs, DC output (e.g. for GPS)
- Alarm: alarm relay contact, alarm input
- Synch. inputs: IRIG-B/AFNOR input (BNC), DCF current loop
- Synch. outputs: DCF current loop, DTS link (GBIC-module)
- Serial: 2 RS 232/485, both for script file progr. serial message
- IRIG: 2 IRIG-B/AFNOR outputs (BNC)
- IRIG DC: 2 DC level IRIG-B/AFNOR outputs (both RS 422 & optocoupler)
- Pulses: 2 DCF or pulse/frequency outputs (both RS 422 & optocoupler)

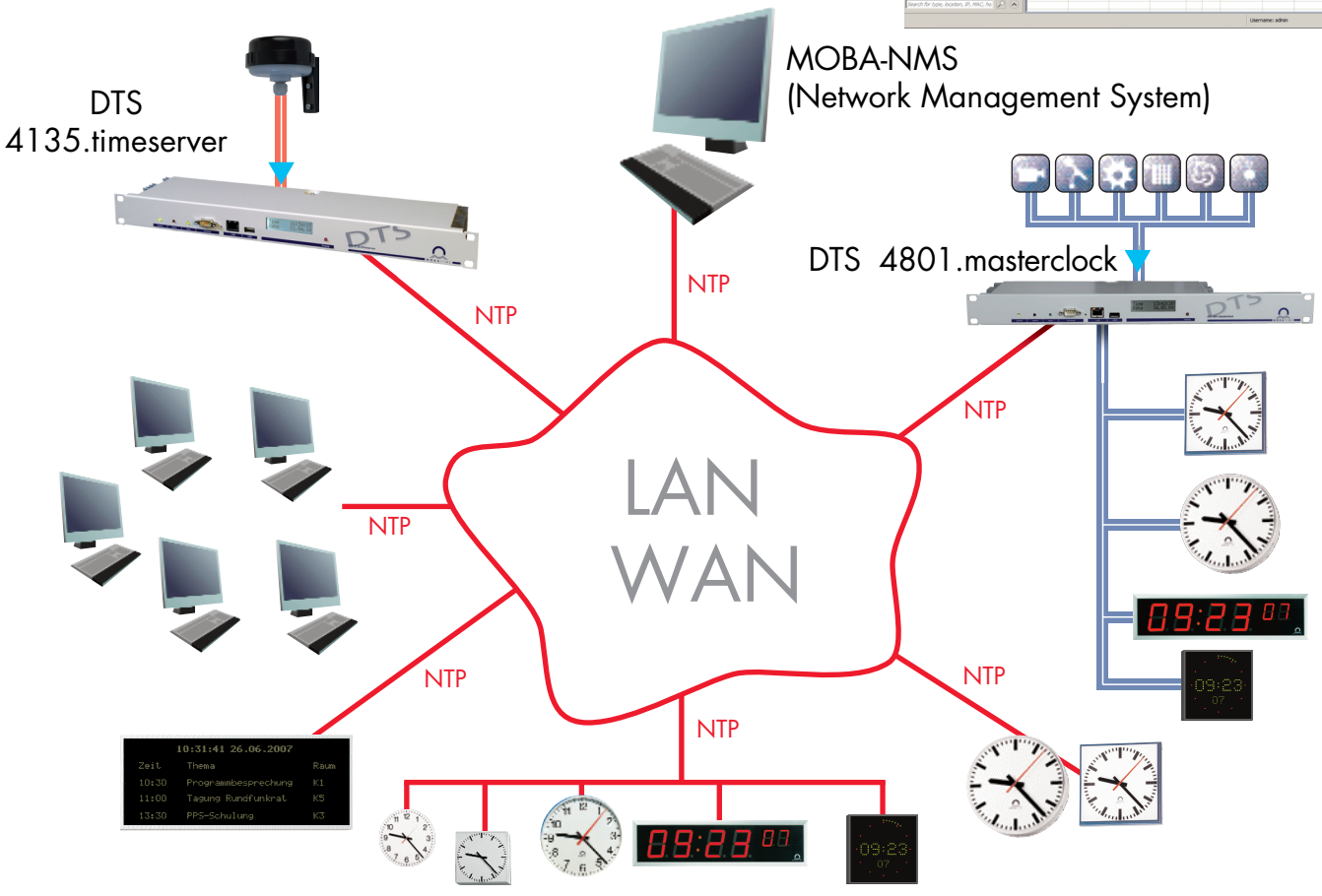


DTS device mounted in a 19" IT-Rack

DTS 4135 - the time source for LAN-based clock and time distribution systems

The DTS 4135.timeserver is a versatile time reference in several respects.
On one hand, it relays the external time signals with maximum precision and reliability. It is compatible with all NTP unicast (IP based) or multicast devices, such as slave clocks with NTP movement (e.g. NBU 190), digital clocks and digital information displays with NTP synchronization. On the other hand, it can also synchronize the NMI (Network Management Interface), which can synchronize master clocks with MOBALine and DCF 77 output.
Even PCs/workstations, photocopiers, printers, fax equipment, time recording terminals, access control systems, central fire alarm systems, image and sound recording equipment, and many other kind of clients in the network can be synchronized by means of the network time protocol (NTP).





DTS 4135 - highest priority for availability and reliability

Redundant NTP server operation

To avoid time deviation between two DTS 4135.timeservers, they can be linked via a fiber-optic connection by using two GBIC modules.

The two time servers automatically negotiate their state as master or slave. The slave is always synchronized by the master. In case of GPS failure, an automatic swap between master and slave state will occur. The parameters for the swap can be configured. The "master" DTS timeserver always has the better NTP stratum level than the slave.

Redundant power

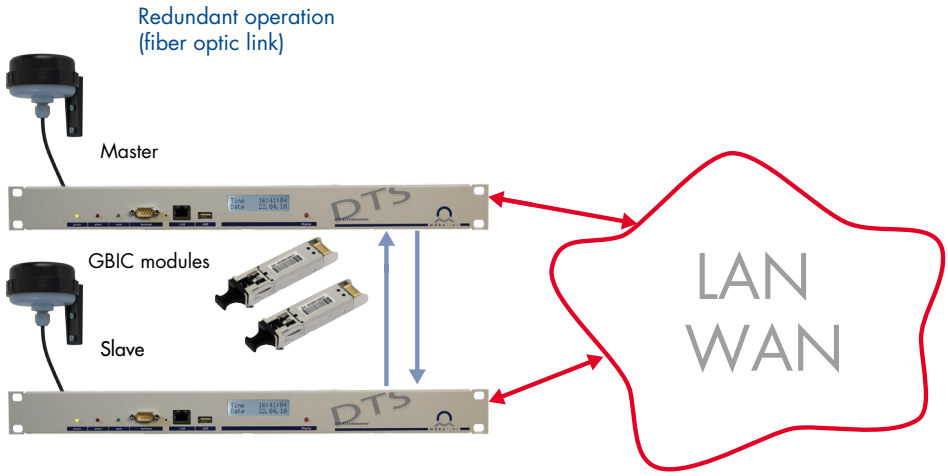
The DTS 4135.timeserver has several monitored power inputs for completely redundant power supply. The non-active power supply input is also monitored.

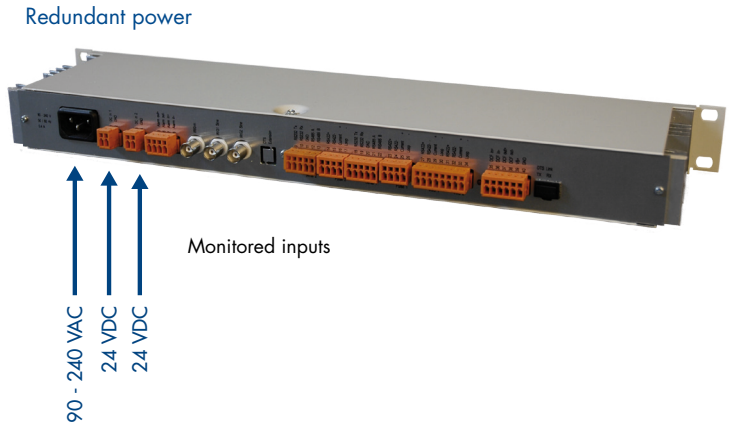
Possible power variants:

- 24 VCD, non-redundant
- 230 VAC, non-redundant
- 24 VDC + 24 VDC, redundant
- 230 VAC + 24 VDC, redundant

Redundant outputs

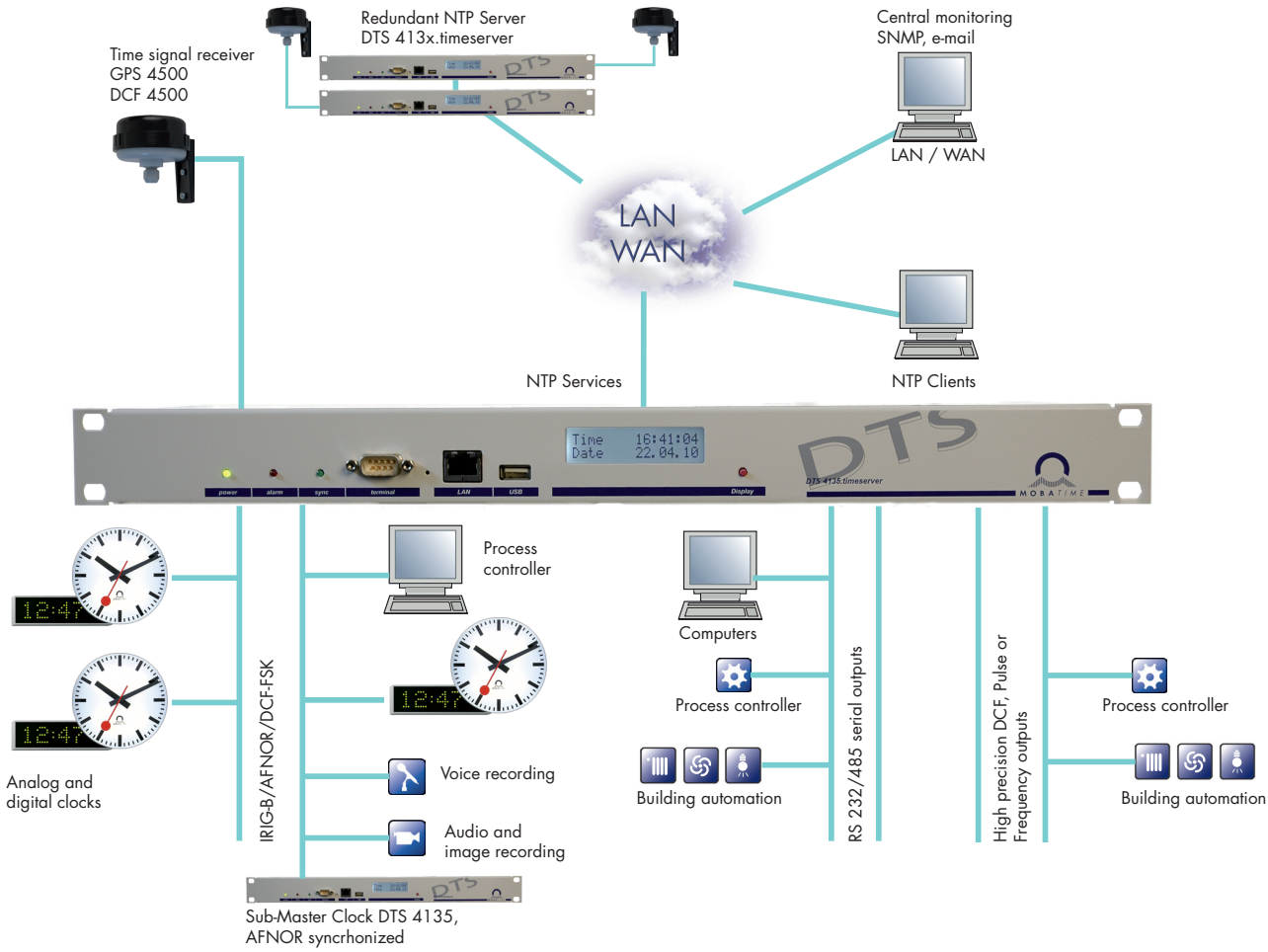
Redundant IRIG-B/AFNOR, serial telegram, DCF and/or pulse/frequency outputs can be achieved by an External Change Over unit (ECO).





DTS 4135 - versatile high precision master clock and NTP time server

DTS 4135.timeserver as NTP server and master clock for high precision IRIG-B/AFNOR outputs, for RS 232/485 serial messages and technical pulses or frequencies.



The DTS 4135.timeserver features two IRIG-B/AFNOR outputs to synchronize analog and digital slave clocks, process controllers, voice recording systems and many other technical equipment.

The DTS 4135.timeserver also features two RS 232/485 serial outputs. Programmable messages with script file allow the synchronization of any kind of technical equipment like e.g. computer server, process controller, fire supervision system, etc.

For utmost precision of the synchronization, two high accurate pulse outputs are provided. They can either be used as DCF outputs (RS 422 and optocoupler) or periodical pulses.

Typical applications are industries, power distribution stations and power plants, where high reliability, high precision, no time leaps and permanent availability are required.

DTS 4135.timeserver - Technical details

Technical Data		
Time signal outputs	NTP V4 (fully V3 compatible) / SNTP, NTP multicast DCF-time signal output (optocoupler passive) 2 x IRIG-B/AFNOR output, each with analog (BNC) and DC level (RS 422 and optocoupler) output 2 x DCF 77, programmable pulses/frequencies (RS 422 and optocoupler) 2 x RS 232/485 serial message programmable by script file	IRIG-B122, B123, B126 AFNOR A, AFNOR C, DCF-FSK, IRIG-B126 IEEE 1344
DTS Links (Redundancy)	Max. length of the fiberglass cable, e.g. multimode fiber Ø 50 µm: multimode fiber Ø 62.5 µm:	max. 550 m max. 275 m
NTP-slave clock line	For slave clocks synchronization by NTP multicast or unicast (IP based) Time zone server function with up to 15 different time zone entries.	
Network services	NTP client NTP server, max. no. of NTP and SNTP client requests: SNMP V1, V2c, V3 (get, put, notification, trap) with MD5 authentication and DES for encryption E-Mail for alarm messages (2 addresses possible) DATE, TIME, FTP (for update)	typical > 1250 request/sec
Network Interface	10BaseT / 100BaseTX (IEEE 802.3) Data transmission rate: auto-negotiation / manual Connection: RJ45 (only shielded cable permitted)	
IP configuration	DHCP, static IPv4, IPv6	
Operation	Serial terminal via RS 232 (front side, sub-D 9p male) Via LAN: MOBA-NMS, Telnet, SSH, SNMP (special software necessary) USB connector for software update, maintenance (config. and log files upload) or file download (e.g. telegram files, etc.)	
LED indication	Power supply, synchronization status, LAN status, alarm, DCF input	
Display	Display for status information: Time, date, IP, alarm, etc. (2 lines with 16 characters)	
Local time calculation	Automatic, preprogrammed daylight saving time change Up to 80 pre-defined time zone entries and 20 user-definable entries All outputs can be individually allocated to a time zone (UTC or local time)	
Accuracy	GPS (DCF input) to NTP server: GPS (DCF input) to DCF 77 / pulse output: NTP to internal time: Redundant operation: master to slave GPS (DCF input) to IRIG (analog) GPS (DCF input) to IRIG (digital) Internal time to serial outputs (jitter: ± 10 ms)	typical < ± 100 µs typical < ± 10 µs typical < ± 100 µs typical < ± 1 µs typical < ± 100 µs typical < ± 10 µs typical < ± 10 ms
Time keeping (internal) DTS 4135 -> TCXO	Synchronized with GPS: Hold over (after > 24h synch. from GPS) at 20°C ± 5°C: Hold over (after > 24h synch. from GPS) at constant temperature: After restart without synchronization (for 24h) at 20°C ± 5°C:	± 10 µs to UTC < ± 10 ms/d or < 0.1 ppm < ± 1ms/d or < 0.01 ppm < ± 250 ms/d or < 2.5 ppm
DTS 4136 -> OCXO	Hold over (after > 24h synch. from GPS) at 20°C ± 5°C:	< ± 1 ms/d or < 0.01 ppm
External time source	External NTP / SNTP server (4 NTP sources possible), or DCF 77 time signal receiver (optocoupler, e.g. DCF 4500), or GPS time signal receiver (optocoupler, e.g. GPS 4500), or IRIG-B 12x/AFNOR (analog) Manual time setting (only for test purposes)	
Alarm relay	Potential free, opening contact for signalizing disturbances	open -> alarm
Alarm input	1 alarm input for monitoring of an external device, 18 - 36 VDC, max. 6 mA	input open -> alarm
Power supply	AC input: 90 to 240 VAC / 50 - 60 Hz / 0.25 A 2 x DC input: 24 VDC +20 % / -10 % / 20 W DC output nominal 28 VDC, max. 400 mA	
Dimensions	19" rack, 1 rack unit, W x H x D	483 x 44 x 125 mm
Weight		approx. 1.8 kg
Power reserve	No internal active running reserve, timekeeping with RTC for short power outages	
Ambient temperature	-5 to +50°C, 10 - 90 % relative humidity, without condensation	
Options	Mini GBIC module (GigaBit Interface Converter) SX LC 1000Mbps, 3.3V fiber optic cable, 2xLC/LC50/125µm patch cable FiberChannel duplex 100 cm	