MICRO-EPSILON

SCIENCE GATE
Your Automation Partner

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More Precision

confocalDT // Confocal chromatic measuring system

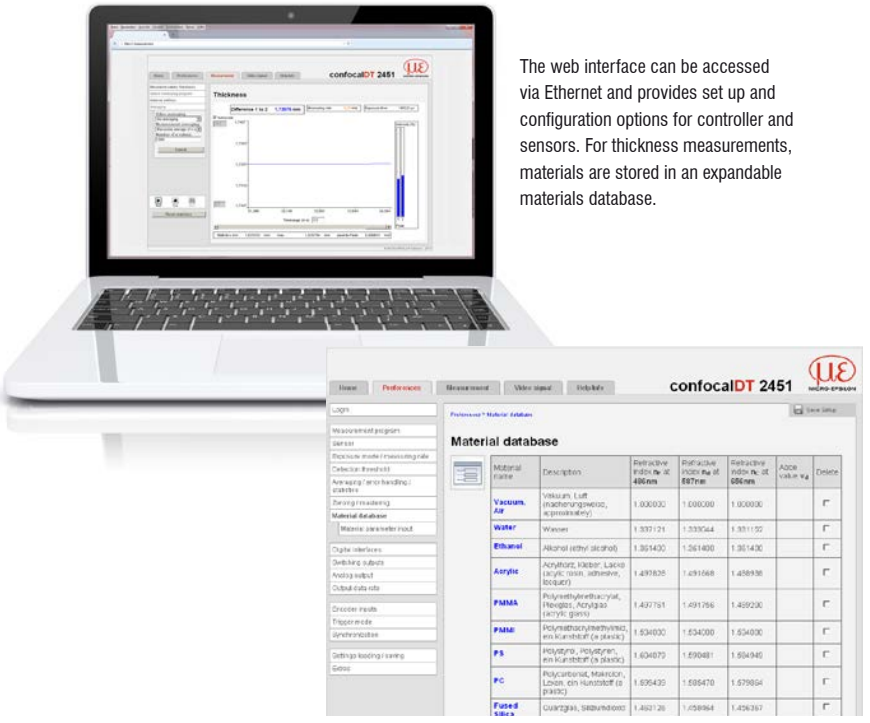
- Measuring rate up to 10kHz
- Ethernet / EtherCAT / RS422 / PROFINET / Ethernet/IP / Analog
- Fast surface compensation
- Configuration via web interface
- Submicrometer resolution
- Multi-layer thickness measurement
- Robust design with passive cooling

The universal confocalDT IFC2451 controllers are used for various industrial measurement tasks. Due to their excellent signal-to-noise ratio, these controllers achieve measuring rates of 10 kHz with white light LEDs.

The active exposure regulation feature in the CCD line enables accurate, fast surface compensation on changing surfaces during dynamic measurement processes.

Due to a user-friendly web interface, no additional software is necessary to configure the controller and the sensors. Data output is via Ethernet, EtherCAT, RS422 or analog output.

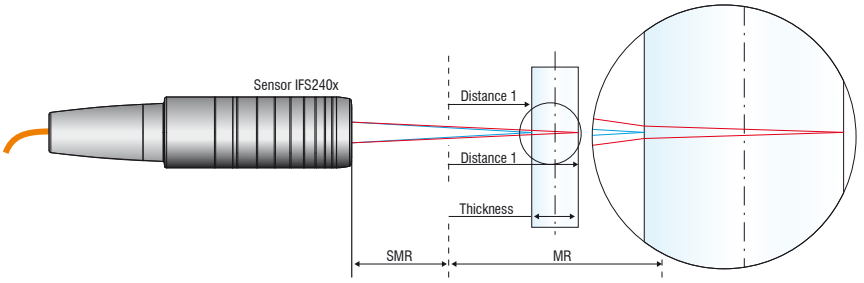
The confocalDT controllers are used for complex distance and thickness measurements and can be combined with any IFS sensor. Furthermore, up to 6 peaks are provided which allows for the thickness of transparent, multi-layer objects to be measured. Optical signals are transferred between sensor and controller via optical fibers.



The web interface can be accessed via Ethernet and provides set up and configuration options for controller and sensors. For thickness measurements, materials are stored in an expandable materials database.

EtherCAT® Conformance tested

EtherCAT Conformance tested: IFC2451



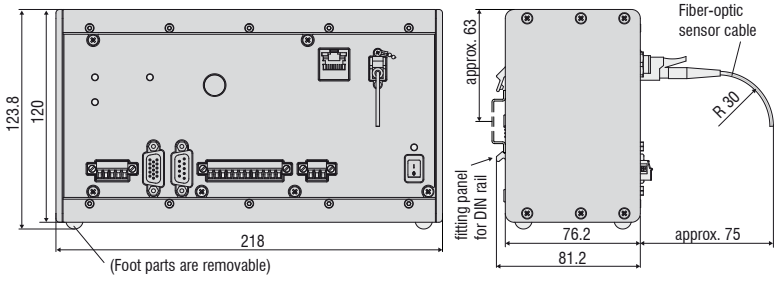
Model		IFC2451	IFC2451MP
Resolution	Ethernet/EtherCAT	1 nm	
	RS422	18 bit	
	analog	16 bits (teachable)	
Measuring rate		continuously adjustable from 100 Hz to 10 kHz	
Linearity		typ. < ±0.025 % FSO (depends on sensor)	
Multi peak measurement		1 layer	5 layers
Light source		internal white LED	
No. of characteristic curves		up to 20 characteristic curves for different sensors per channel, selection via table in the menu	
Permissible ambient light [1]		30,000 lx	
Synchronization		yes	
Supply voltage		24 VDC ±15 %	
Power consumption		approx. 10 W	
Signal input		sync-in / trig-in; 3x encoder (A, B, index)	
Digital interface		Ethernet; EtherCAT; RS422; PROFINET [2]; EtherNet/IP [2]	
Analog output		Current: 4 … 20 mA; voltage: 0 ... 10 V / -10 … +10 V (16 bit D/A converter)	
Switching output		Error1-Out, Error2-Out	
Digital output		sync-out	
Connection	optical	pluggable optical fiber via E2000 socket, length 2 m ... 50 m, min. bending radius 30 mm	
	electrical	3-pin supply terminal strip; Encoder connection (15-pin, HD-Sub socket, max. cable length 3 m); RS422 connection socket (9-pin, Sub-D, max. cable length 30 m); 3-pin output terminal strip (max. cable length 30 m); 12-pin I/O terminal strip (max. cable length 30 m); RJ45 socket for Ethernet / EtherCAT (max. cable length 100 m)	
Installation		free-standing, DIN rail mounting	
Temperature range	Storage	-20 … +70 °C	
	Operation	+5 … +50 °C	
Shock (DIN EN 60068-2-27)		15 g / 6 ms in XYZ axis, 1000 shocks each	
Vibration (DIN EN 60068-2-6)		2 g / 20 … 500 Hz in XYZ axis, 10 cycles each	
Protection class (DIN EN 60529)		IP40	
Material		Aluminum	
Weight		approx. 2.2 kg	
Compatibility		compatible with all confocalDT sensors	
No. of measurement channels		1	
Control and display elements		ON/OFF switch; multifunction button (for dark alignment and reset to factory settings after 10 s); 4x LEDs for intensity, range, status and supply voltage	

FSO = Full Scale Output

[1] Illuminant: light bulb

[2] Optional connection via interface module (see accessories)

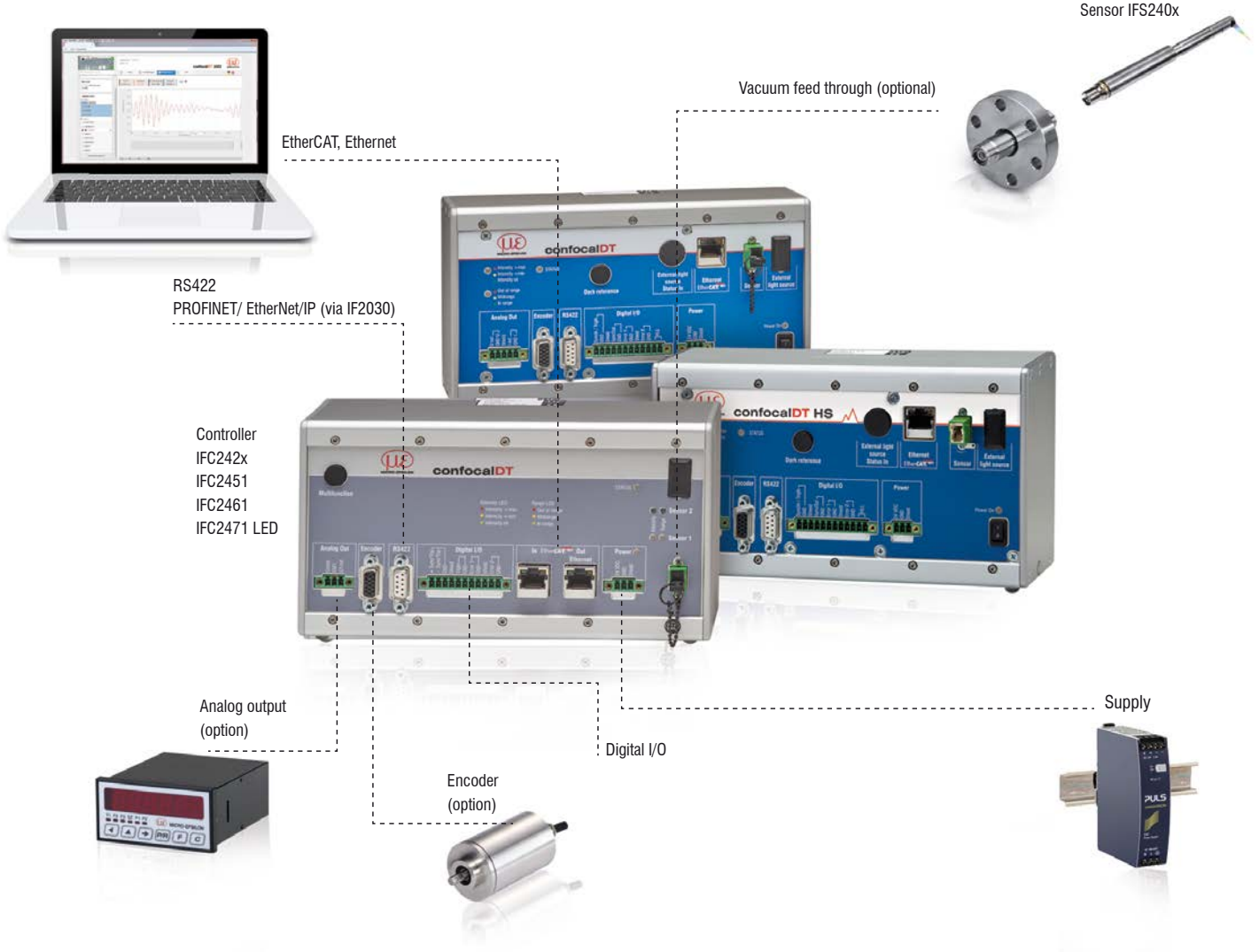
IFC2451 controller



System design

The confocalDT system consists of:

- Sensor IFS240x
- Controller IFC24xx
- Fiber optic cable C24xx

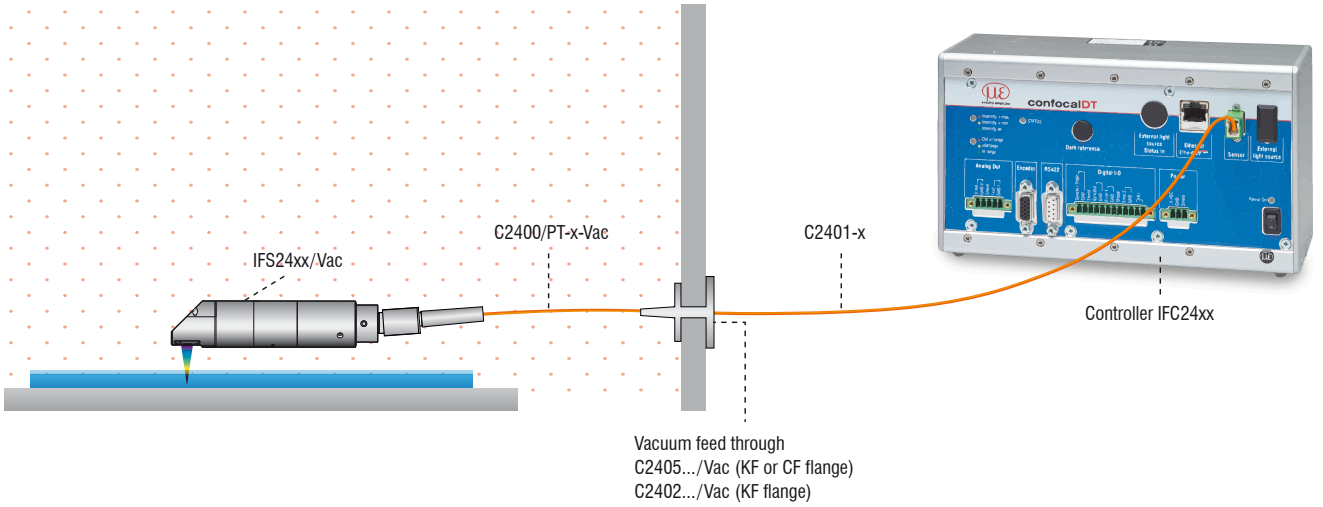


Customer-specific modifications

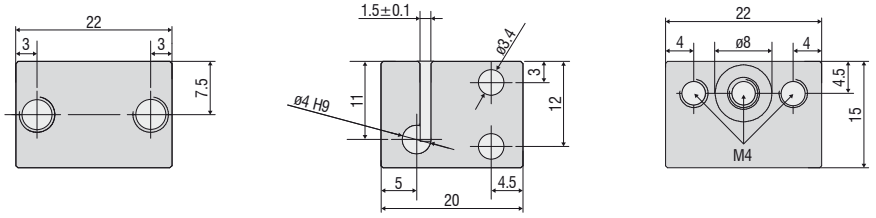
Application examples are often found where the standard versions of the sensors and the controllers are performing at their limits. To facilitate such special tasks, it is possible to customize the sensor design and to adjust the controller accordingly. Common requests for modifications include changes in design, mounting options, customized cable lengths and modified measuring ranges.

Possible modifications

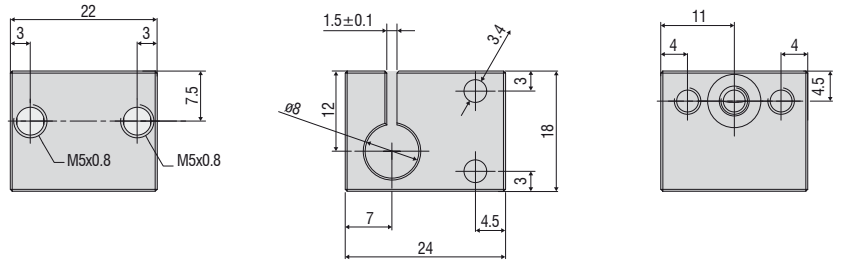
- Sensors with connector
- Cable length
- Vacuum suitability up to UHV
- Specific lengths
- Customer-specific mounting options
- Optical filter for ambient light compensation
- Housing material
- Measuring range / Offset distance



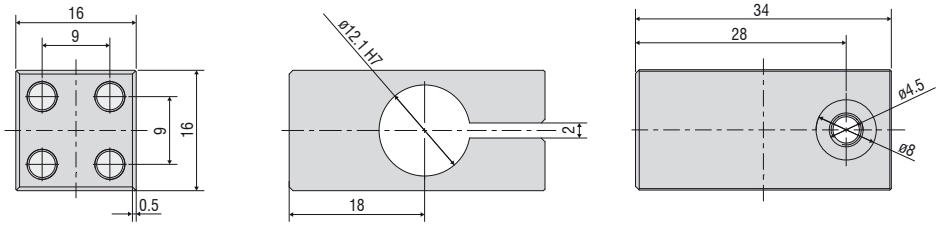
Accessories: mounting adapter
MA2402 for sensors 2402



Accessories: mounting adapter
MA2403 for sensors 2403

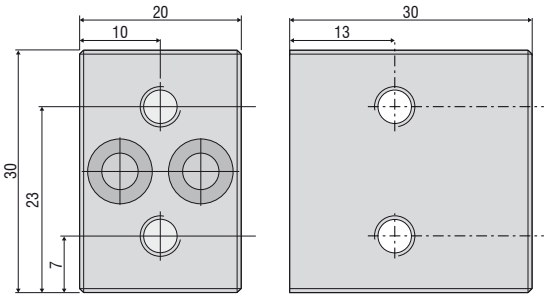


Accessories: mounting adapter
MA2404-12 for sensors IFS2404-2 / IFS2404/90-2 / IFS2407-0,1

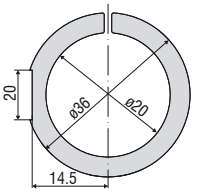


Accessories: mounting adapter
MA2400 for sensors IFS2405 / IFS2406 / IFS2407 (consisting of a mounting block and a mounting ring)

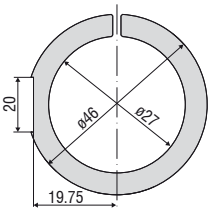
Mounting block



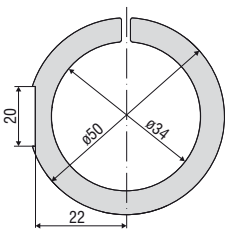
Mounting ring



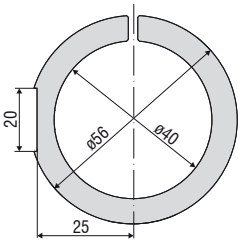
MA 2406-20
for sensors
IFS2406-2,5
IFS2406/90-2,5



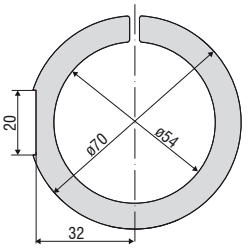
MA 2400-27
for sensors
IFS2405-0,3 / -1
IFS2406-3 / -10



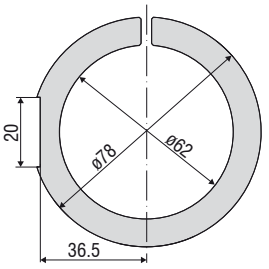
MA 2405-34
for sensors
IFS2405-3



MA 2405-40
for sensors
IFS 2405-6



MA 2405-54
for sensors
IFS2405-10 / IFS2407-3



MA 2405-62
for sensors
IFS2405-28 / -30

Accessories

Software

IFD24xx-Tool	Software demo tool included

Accessories light source

IFL2422/LE	Lamp module for IFC2422
IFL24x1/LED	Lamp module for IFC24x1
IFL2451/LED(003)	Lamp module for IFC2451(003)

Cable extension for sensors

CE2402 cable with 2x E2000/APC connectors

CE2402-x	Extension for optical fiber (3 m, 10 m,13 m, 30 m, 50 m)
CE2402-x/PT	Extension for optical fiber with protection tube for mechanical stress (3 m, 10 m, customer-specific length up to 50 m)

Cable for IFS2404 sensors

C2404-x	Optical fiber with FC/APC and E2000/APC connectors Fiber core diameter 20 µm (2 m)

Cables for IFS2405/IFS2406/2407-0,1 sensors

C2401 cable with FC/APC and E2000/APC connectors

C2401-x	Optical fiber (3 m, 5 m, 10 m, customer-specific length up to 50 m)
C2401/PT-x	Optical fiber with protection tube for mechanical stress (3 m, 5 m, 10 m, customer-specific length up to 50 m)
C2401-x (01)	Optical fiber core diameter 26 µm (3 m, 5 m, 15 m)
C2401-x(10)	Drag-chain suitable optical fiber (3 m, 5 m, 10 m)

C2400 cable with 2x FC/APC connectors

C2400-x	Optical fiber (3 m, 5 m, 10 m, customer-specific length up to 50 m)
C2400/PT-x	Optical fiber with protection tube for mechanical stress (3 m, 5 m, 10 m, customer-specific length up to 50 m)
C2400/PT-x-Vac	Optical fiber with protection tube suitable for use in vacuum (3 m, 5 m, 10 m, customer-specific length up to 50 m)

Cable for IFS2407/90-0,3 sensors

C2407-x	Optical fiber with DIN connector and E2000/APC (2 m, 5 m)

Vacuum feed through

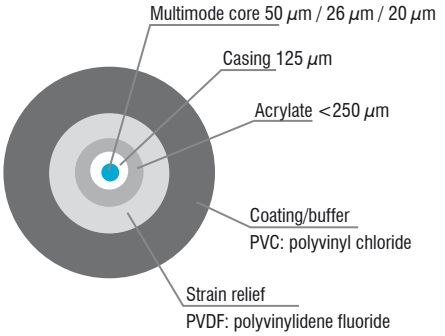
C2402/Vac/KF16	Vacuum feed through with optical fiber, 1 channel, vacuum side FC/APC non-vacuum side E2000/APC, clamping flange KF 16
C2405/Vac/1/KF16	Vacuum feed through on both sides FC/APC socket, 1 channel, clamping flange type KF 16
C2405/Vac/1/CF16	Vacuum feed through on both sides FC/APC socket, 1 channel, flange type CF 16
C2405/Vac/6/CF63	Vacuum feed through FC/APC socket, 6 channels, flange type CF 63

Other accessories

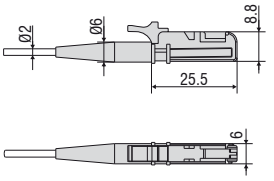
SC2471-x/USB/IND	Connector cable IFC2451/61/71, 3 m, 10 m, 20 m
SC2471-x/IF2008	Connector cable IFC2451/61/71-IF2008, 3 m, 10 m, 20 m
PS2020	Power supply 24V / 2.5A
EC2471-3/OE	Encoder cable, 3m
IF2030/PNET	Interface module for PROFINET connection
IF2030/ENETIP	Interface module for EtherNet/IP connection

Optical fiber

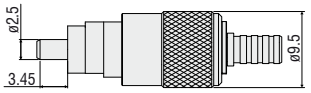
Temperature range : -50 °C to 90 °C
Bending radius: 30/40 mm



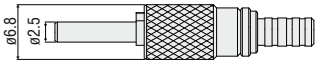
E2000/APC standard connector



FC/APC standard connector



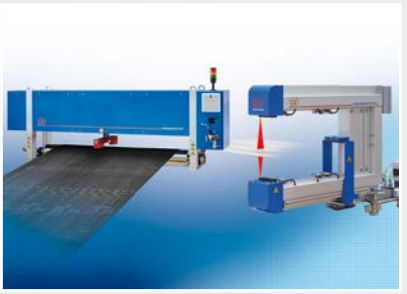
DIN connector



Sensors and Systems from Micro-Epsilon

Sensors and systems for displacement, distance and position

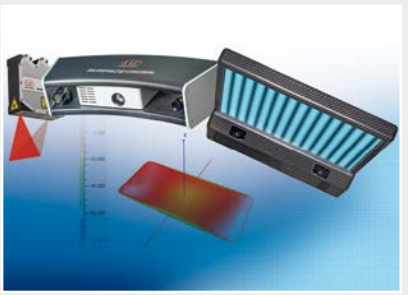
Sensors and measurement devices for non-contact temperature measurement



Measuring and inspection systems for metal strips, plastics and rubber

Optical micrometers and fiber optics, measuring and test amplifiers

Color recognition sensors, LED analyzers and inline color spectrometers



3D measurement technology for dimensional testing and surface inspection

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