



Time of flight LASER DISTANCE MEASUREMENT

Dilas FT

FT1600

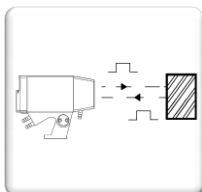


**Digital communication:
Profibus-DP, Profinet, Ethernet Modbus TCP**

Long range - High temperature targets

High accuracy +/- 1mm

Design for steel industry conditions



E 1419



Operating principle

The operation of the **Dilas FT1600** is based on time of flight measurement. The sensor calculates the distance of the target surface using the time of flight of visible laser light pulses. The measurement and sensor's status are delivered on the digital communication.

Presentation

The **Dilas FT1600** is an autonomous sensor mounted in compact aluminium housing, IP66. The sensor can be ordered with mounting bracket or water cooling jacket.

For electrical connection, the sensor has three M12 connectors: one for the power supply and outputs, and two for communication.

The sensor can work as a standalone unit ; in that case, the setup is made from the control panel at the back of sensor. The parameters can also be set through the communication link when it is in use (on FT1604 only).

A digital display indicates the measured distance and two LED indicate status of sensor.

Two additional LED indicate the communication link status.



Features and benefits

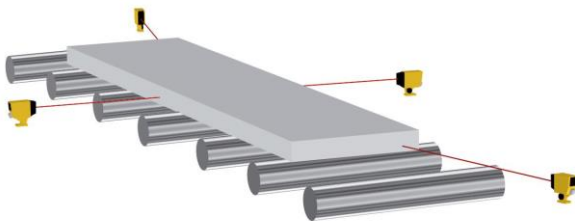
The **Dilas FT1600** is a digital, high resolution, non-contact laser measurement or detection sensor. The target may be hot or cold, stationary or moving. **Dilas FT1600** measures on all non-shiny surfaces.

- Measurement range: up to 50 m on natural surface, 500 m on reflective tape (see Accessories)
- Target temperature: up to 1300 °C
- Accuracy: up to ± 1 mm (1σ)
- Digital communication: **Profibus-DP** (FT1602-•C) or **Profinet** (FT1603-•C) or **Ethernet Modbus-TCP** (FT1604-•C)
- Analog output 4-20 mA
- Visible laser beam (class 2)
- Autonomous sensor: ready to use, no calibration required
- Integrated 5 digits display
- Easy sensor setup with pre-set distances selection or extended configuration
- Special modes optimized for Detection and Tracking
- Water cooling & air purging ; optional heat shield (model FT160•- JC)

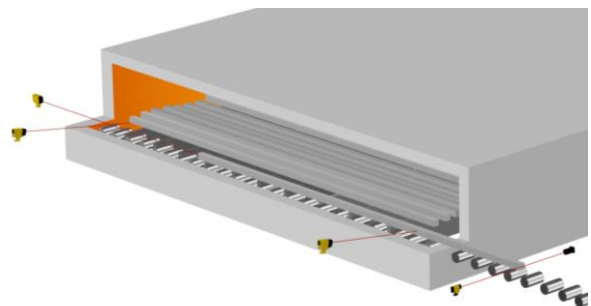
Typical applications

The **Dilas FT1600** is well designed for applications of measure (dimensions, position) of slabs, billets, blooms, coils, plates, ...and to detect product while passing in front of sensor. The product can be hot or cold.

Here are some examples:



Slab dimension measurement



Furnace entry: detection and position control



Performances

Sampling time	Target	Distance range	Accuracy (1σ) (2)
Auto mode (variable period, optimized for the measurement conditions)	black surface (6% remission)	0.15 to 20 m	+/- 1 mm
	natural surface, grey (13% remission)	0.15 to 50 m	+/- 1 mm
	white matt surface (80% remission)	0.15 to 100 m	+/- 1 mm
	reflective tape (1)	50.0 to 500 m	+/- 1 mm
50 - 100 - 200 - 500 ms	black surface (6% remission)	0.50 to 10 m	+/- 1 mm
	natural surface, grey (13% remission)	0.15 to 25 m	+/- 1 mm
	white matt surface (80% remission)	0.15 to 40 m	+/- 1 mm
10 - 20 ms	white matt surface (80% remission)	0.50 to 30 m	+/- 2.5 mm



Laser Class 2

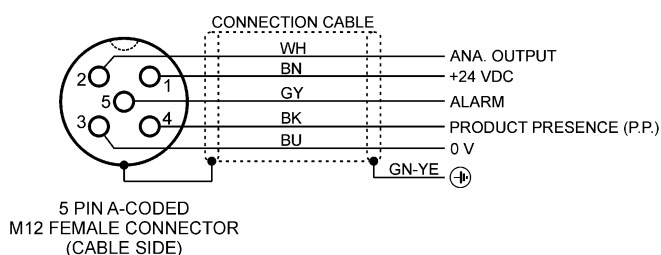


Technical specifications

Model	FT1602-•C	FT1603-•C	FT1604-•C
Communication protocol	Profibus-DP	Profinet	Ethernet Modbus-TCP
Maximum target temperature	1300 °C (2370 °F)		
Resolution	0.1 mm		
Laser beam size	4 x 5 mm at 10 m ; 6 x 7 mm at 50 m ; 130 x 170 mm at 500 m		
Laser (IEC 60825-1)	≤ 1 mW class 2, red, 655 nm		
Measurement output (3)	4-20 mA (500 Ω max.)		
2 Digital outputs:	PNP "High side" 0.1A: - PP (Product Presence): 24 V in product presence - AL (Alarm): 24 V when alarm activated (internal failure)		
Display	5 digits LED display - 2 status LED - 2 communication link status LED		
Setting	2 rotary switches to: * choose between 6 preconfigured fields (3, 5, 7, 10, 20 m) * select & adjust measuring range, mode & address Extras modes optimized for Detection or Tracking applications Setting can also be done via communication link (FT1604)		
Operating voltage	10 to 30 VDC		
Power consumption	< 10 W		
Cable	Power supply and analogue outputs cable: connector fitted with silicone cable with protective steel braid. Standard length of 2 m (other length: 3, 5 or 8 m) (communication cables not included)		
Weight	2.6 kg (FT160- LC) - 3.0 kg (FT160- JC)		
Protection rating	IP 66 (cast aluminium case)		
Air Purging	Protection of the optic with clean air: 50 to 200 g/cm ² , 4 to 16 l/min		
Operating temperature	-10 °C to 55 °C (14 °F to 140 °F) without cooling, Up to 120 °C (250 °F) with water cooling: industrial quality water at about 25 °C, pressure 1-2 bar and flow 1-2 l/min.		

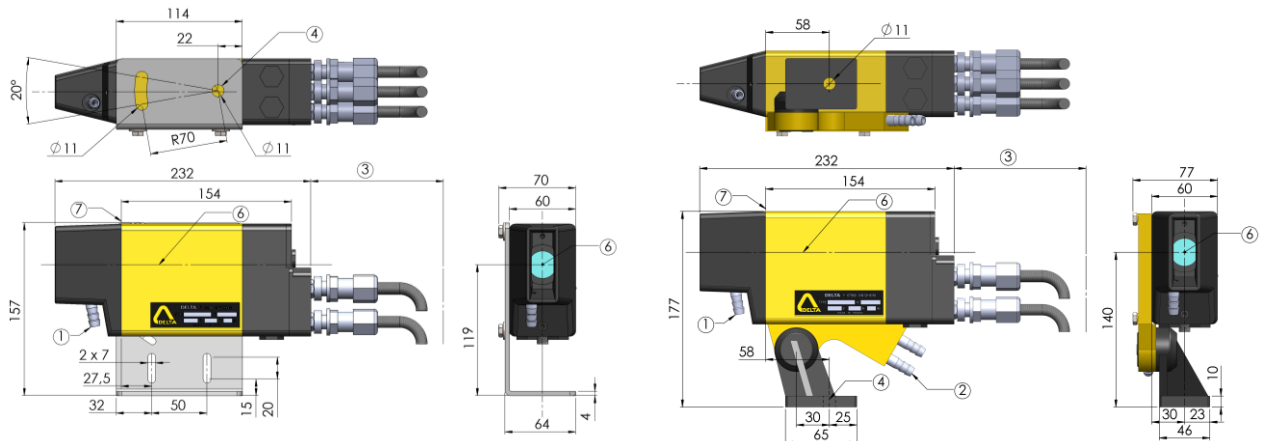
- (1) Reflective tape Oralite ® 5200 white 1x1 m, useable between 50 m and 500 m.
- (2) Accuracy can be deteriorated by an intense ambient light, a reflecting or an absorbing surface, air turbulences.
- (3) Total output error at 20 mA: + 0.15 % at a temperature of 25 °C.

Connection





Dimensions



- ① Air supply \varnothing 10
- ② Water supplies \varnothing 10
- ③ Connector clearance 140 mm
- ④ Mounting with screw \varnothing 10
- ⑤ Optical axis
- ⑥ Optical axis
- ⑦ Measurement Ref.

Reference for order

Case	Communication	Mounting	Cable (power & analogue output)
	FT1602-•C Profibus-DP	L Bracket FT160-LC	Cable length: 2: 2 m (standard length) L= 3: 3 m 5: 5 m 8: 8 m
	FT1603-•C Profinet		
	FT1604-•C Ethernet Modbus-TCP	J Mounting stand & Cooling jacket FT160-JC	

Example: **FT1602-JC 24VDC L=2**. That means Dilas FT1600 sensor with Profibus-DP communication, mounting stand & cooling plate, 2 m cable with connector for power and analogue output (communication cables not included).

Accessories

- Termination resistor for Profibus (male connector M12, B-coded, ref. 2536756).
- Communication cables with protective steel braid: see separate datasheet.
- Heat shield to protect from direct radiation, only for FT160-JC models (ref. 7093146).
- Reflective tape Oralite® 5200 white 1x1 m (ref. 2636434), useable between 50 m and 500 m. Can increase the reflectivity of your surface to improve response time of Dilas FT1600 in case of fixed target.



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