OMRON

Model ZX-GTC11/41

Smart Sensor

INSTRUCTION SHEET

Thank you for purchasing an OMRON ZX-GT-series (Laser Type CCD Sensor) Smart Sensor.
These instructions contain information on functions, performance, and usage for proper operation.
To ensure safety, read this Instruction Sheet carefully before using the Sensor. In addition, keep this Insutruction Sheet in an easily accessible location for quick reference when needed.

TRACEABILITY INFORMATION:
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The following notice applies only to products that carry the CE mark:
Notice:
This is a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.

9900674-3C

PRECAUTIONS FOR SAFE USE

Observe the following precautions to ensure safety.
①Environment
・Do not use the Smart Sensor in locations subject to explosive or flammable gases.
・To ensure safety in operation and maintenance, do not install the Smart Sensor near high-voltage equipment or power devices.
②Power Supply and Wiring
・Do not apply voltage exceeding the rated voltage (24VDC +10%, -15%).
・When supplying power to the Sensor, make sure that the polarity of the power is correct, and do not connect to an AC power supply.
・Do not short-circuit a load for outputs.
・Do not lay a power supply cable for the Smart Sensor together with high-voltage lines or power lines. Doing so, or placing them into the same duct world cause induction and lead to malfunction or damage.
・The Sensor Head must use special goods (ZX-GT28R).
It causes the malfunction and the breakdown if it uses it excluding special goods.
・When the Controller is connected and used mutually, Please use this product by combining specification.
③Others
・Do not attempt to disassemble, repair, modify, deform or burn this product.
・When disposing of the Smart Sensor, treat it as industrial waste.
・Please contact our banch and the office after it turns off power when you feel abnormality by any chance.

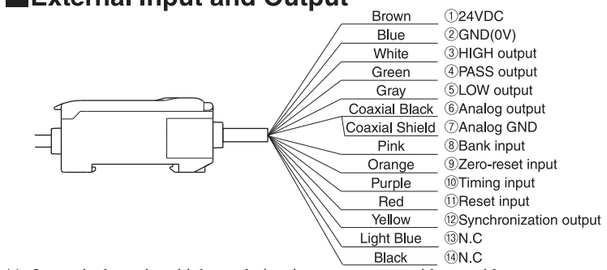
Detailed information for the functions and operation of the ZX-GT-series Smaet Sensors is available in an Operation Manual (Cat. No.SCHE-746), which is sold separately. Ask your OMROM representative for details. The Operation Manual can also be downloaded from the following Web site for free of charge:

http://www.fa.omron.co.jp/

PRECAUTIONS FOR CORRECT USE

①Environment
Do not install the Smart Sensor in the following locations:
・Locations subject to strong electromagnetic fields or in an environment where the operation of the Sensor is subject to the reflection of intense light (such as other laser beams or electric arc-welding machines.)
・Locations where the ambient temperature exceeds the rated temperature range.
・Locations subject to rapid changes in temperature (causing condensation).
・Locations where the relative humidity exceeds the range of 35% to 85%.
・Locations subject to corrosive or flammable gases.
・Locations where dust, salt, or metallic powder accumulate on the Sensor.
・Locations subject to direct vibration or impact.
・Locations subject to direct sunlight.
・Locations subject to exposure to water, oil, chemicals, etc.
・Locations subject to strong electromagnetic or electrical fields.
②Power Supply and Wiring
・The total length of the Sensor cable and Controller cable must be 30m or less. Use a ZX-GXC□□ Extension Cable (order separately) if required to extend the cable between a Sensor Head and a Controller. Use a shielded cable to extend the Controller cable. The shielded cable must be the same kind as that of the Controller cable.
・When using a commercially available switching regulator, ground the FG (frame ground) terminal.
・If the power supply line is subject to surges, connect a surge absorber that meets the conditions of the usage environment.
・When using a ZX-CAL2 Calculating Unit to connect multiple Controllers, connect the analog ground of each Controller together.
・Do not connect/disconnect the Sensor Head from the Controller with power on, or it might get damaged.
③Warm-up
After tuning ON the power, allow the Smart Sensor to warm up for approximately 10 minutes prior to use. The circuitry is not stable immediately after turning the power ON, and the values gradually change until the Sensor is completely warmed up.
④Maintenance and Inspection
・Always turn OFF the power supply before adjusting or removing the Sensor Head.
・Do not use thinners, benzene, acetone, or kerosene for cleaning the Sensor Head or Controller.

External Input and Output



*1. In particular, when high resolution is necessary, provide a stable power source separate from other power systems.
*2. Damage may result if not wired correctly. (In particular, do not allow the analog output to contact other wires.)

Rating/Performance

Item / Model		ZX-GTC11	ZX-GTC41
Agreement receiver		ZX-GT28R	
Agreement emitter		ZX-GT28E11	ZX-GT28E41
Measurement period		Stability mode: 1.5ms, Speedy mode: 0.5ms *1	
Possible average count setting *2		1/2/4/8/16/32/64/128/256/512/1024/2048/4096	
Analog output *3		4～20mA/F.S. maximum load resistance 300Ω, ±4V(±5V, 1-5V *4) output impedance 100Ω	
Timing input, Bank switch input Zero reset input, Reset input		On: Short-circuited with 0V terminal or 1.5V or less Off: Open (leakage current 0.1mA max.)	On: Short-circuited to supply voltage within 1.5V of supply voltage Off: Open (leakage current 0.1mA max.)
Decision output (HIGH/PASS/LOW:3 output) *5 Synchronization output *6		NPN Open collector output 30VDC 50mA max. Residual voltage 1.2V or less	PNP Open collector output 30VDC 50mA max. Residual voltage 2V or less
Indicator lamp		Measurement status indicator: HIGH(orange), PASS(green), LOW(orange) , 7-segment digital main display (red) 7-segment digital sub-display (yellow), Bank indicator (orange), Zero reset indicator (green)	
Function	Bank number	2 banks	
	Measurement mode	Width of shading, Width of light, Diameter, Center position, Pin pitch determination, Pin Diameter Determination Specified edge measurement, Wire position detection, Glass edge mode	
	Display	Measurement value display, setting value display, Resolution display (change number of display digits)	
	Zero reset function	Offset setting of zero reset value, zero reset memory	
	Hold	Sample hold, Peak hold, bottom hold, Peak to Peak hold, Average hold	
	Timer	On-delay, Off-delay, One-shot, Delay-hold	
	Adjust function	Beam alignment light volume data writing mode, Adjustable binary level, Adjustable edge filter, Scaling of analog output	
	Calculation	Calculation with 2 set is availabel. (Calculation unit ZX-CAL2 are required to connect two controllers) A-B, A+B, Thickness	
	Others	Threshold value settings, Hysteresis setting, Initial reset, Function lock	
Temperature drift		±0.005%F.S./℃	
Current consumption		150mA max. (The receiver is contained)	
Power supply voltage		24VDC +10%, -15% Ripple (p-p) 10% max.	
Dielectric strength		1000VAC at 50/60Hz for 1min	
Insulation resistance		20MΩ at 500VDC	
Ambient temperature		Operating: 0 to +50℃, Storage: -15 to +60℃ (with no icing or condensation)	
Ambient humidity		Operating/Storage: 35 to 85% (with no condensation)	
Vibration (durability)		10 to 150Hz Half-amplitude of 0.35mm for 80 minutes each in X, Y, and Z directions	
Protective structure		IEC60529 IP20	
Cable length		2m	
Material		Case: PBT (polybutylene terephthalate), Cover: Polycarbonate	
Weight (paced state)		Approx.330g	
Accessories		Instruction manual	

*1. Speedy mode of Pin pitch determination and Pin Diameter Determination is 1ms. *2. The response time is calculated as (measurement period) (average count setting + 1) + 1ms
*3. Current/voltage output can be switched by using the switch on the bottom of the Controller. *4. Can be set with analog output.
*5. When all of the three outputs(HIGH/PASS/LOW) are turned off, it means error.
*6. Connect with synchronization input of an emitter for stability mode. PNP type Controller needs PNP type Emitter. With Speedy mode, Synchronization output does not have to be connected with Synchronization input of Emitter.

*3. Blue(0V) is for the power supply. The shield wire (analog GND) is used for analog output along with the black wire (analog output). Even if you will not be using the analog output, connect the shield wire (analog GND) to GND(0V).
①24VDC
This is for power supply. The wire is also used as common I/O terminal with PNP type.
②GND(0V)
This is for GND(0V). The wire is also used as common I/O terminal with NPN type.
③④⑤Measurement status output
The measurement result is output according to HIGH, PASS and LOW.
⑥Analog output
The analog output corresponding to measurement is output. Current output 4 to 20mA or voltage output -4V to 4V can be selected.
(Please refer to nomenclature about switch in the bottom)
⑦Analog GND
This is for GND of the analog output.
⑧Bank input
This product has two banks for setting.
Bank input OFF: Bank1, Bank input ON: Bank2
Threshold for HIGH/LOW and hysteresis can be stored in each bank
⑨Zero-reset input
Zero-reset can be set.
・Input time is 0.2s to 0.8s : Zero reset is set.
・Input time is 1s or more : Zero reset is released.
⑩Timing input
The timing input is used to control the timing of hold function.
"TIMIG" is displayed on sub-digital display, while Timing input is ON.
⑪Reset input
This is for resetting each output. When this input is on, output status is as follows.

Output	Status
HIGH PASS LOW	OFF
Analog	Approx.23mA or 5.5V

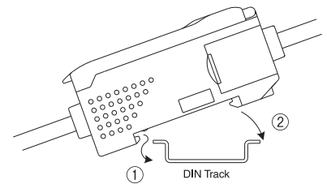
"RESET" is displayed on sub-digital display, while Reset input is ON.
⑫Synchronization output
As Stability mode, Synchronization output needs to be connected with Synchronization input of Emitter.
NPN type of Emitter is needed with NPN Controller.
PNP type of Emitter is needed with PNP Controller.
With Speedy mode, Synchronization output does not have to be connected with Synchronization input of Emitter.

Connections

[Sensor Head and Controller]
Insert the output cable connector of the Sensor Head into the input cable connector of the Controller until the connector ring locks into place. When disconnecting the Sensor Head, hold the connector ring and controller connector and pull them straight out.
Note: Do not touch the pins or contacts inside the connectors.

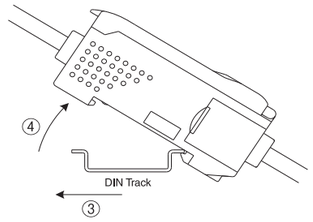
Installation

[Mounting]
①Mount the front of the Unit to the DIN Track.
②Press the rear of the Unit onto the DIN Track.

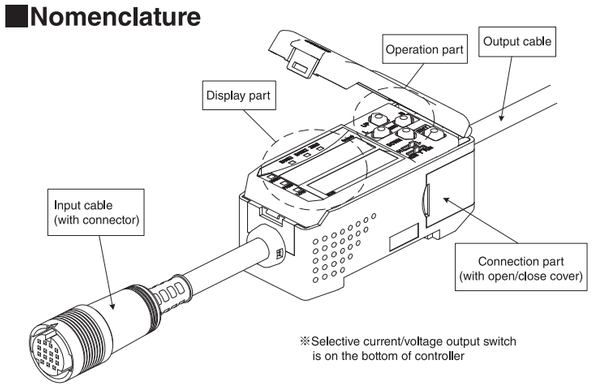


Note: Always mount the front of the Unit first. Mounting strength may decrease if mounting is performed in the reverse order.

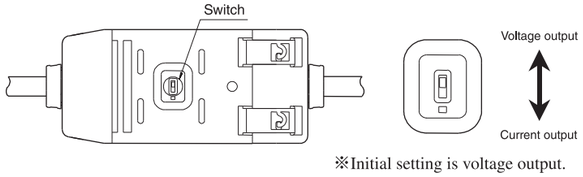
[Removing]
③Press the Unit toward the front.
④Lift the front side.



Nomenclature



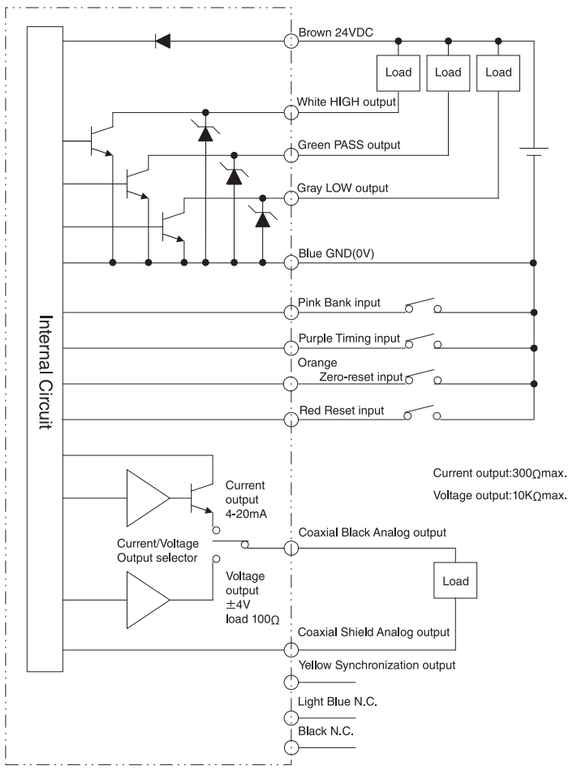
The current/voltage output selector for the analog output is on the bottom of the Controller.



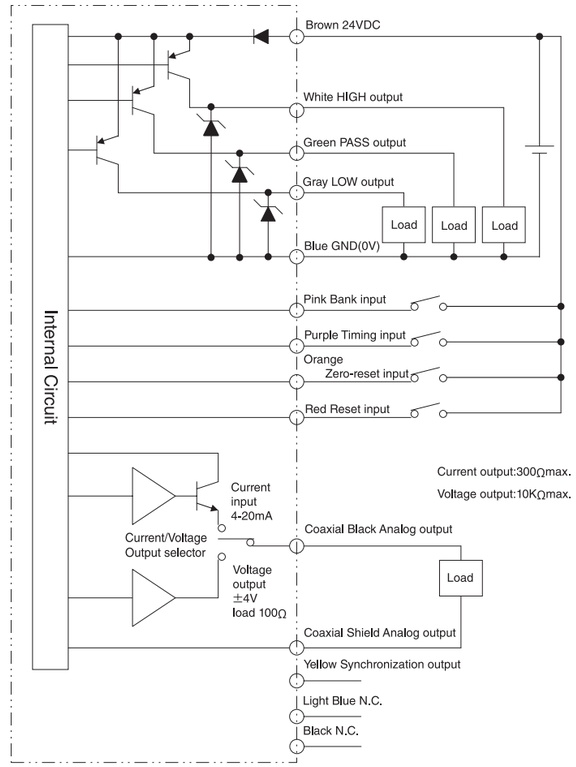
※Initial setting is voltage output.

Input/Output Circuit

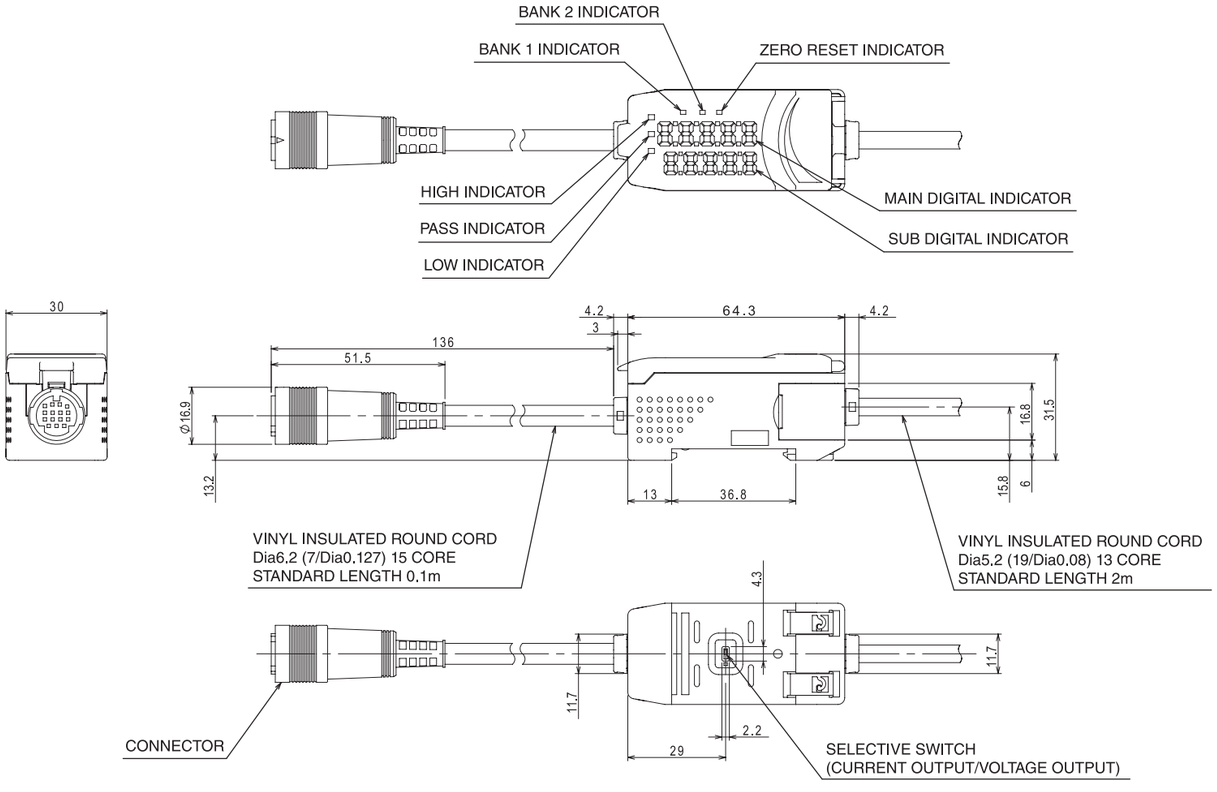
·NPN type (ZX-GTC11)



·PNP type (ZX-GTC41)



Dimensions



[UNIT:mm]

Controls

○Mode Switch: RUN, T, or FUN
Any of the following three modes can be selected:
RUN Mode...Normal operation mode
T Mode...Mode for setting the threshold values
FUN Mode...Function mode to perform other settings
○Threshold Switch: HIGH or LOW
Switches the threshold value (HIGH/LOW) for the display setting in T or RUN Mode.
○Keys
The normal functions or the keys are listed in the following table

Key	RUN Mode	T Mode	FUN Mode
UP ▲	Timing input	Threshold value changes forward	Function setting value changes forward
DOWN ▼	Resets input if pressed continuously for 3 seconds	Threshold value changes backward	Function setting value changes backward
RIGHT ►	Sub-digital display content changes forward	Threshold value digit changes forward	Function setting selection moves forward
LEFT ◄	Sub-digital display content changes backward	Threshold value digit changes backward	Function setting selection moves backward
ENT ■	Pressed continuously for 1 second or longer: Zero-reset Pressed continuously with the RIGHT Key for 3 seconds of longer:Zero reset release	Threshold value flashing: Threshold value confirmed	Function setting flashing (setting): Setting value confirmed Settings initializaion: Setting initialized if pressed continuous for a long time

Display on Main Digital Display
The measured value (after scaling, calculation, etc.) is displayed.
Display on Sub-Digital Display
①Threshold value
The threshold value is displayed.
②Voltage value
The voltage value is displayed. “V” is displayed as the rightmost digit.
A display voltage value is a standard. It is not completely in agreement with an actual output.
③Current value
The current value is displayed. “mA” is displayed as the rightmost digit.
A display current value is a standard. It is not completely in agreement with an actual output.
④Resolution
The resolution of the liner output is displayed.
The letter “r” is displayed as the leftmost digit.
The value is updated approximately every second.
⑤Present value
Present measurement value is displayed, with decimal point.

Alphabet Display Format

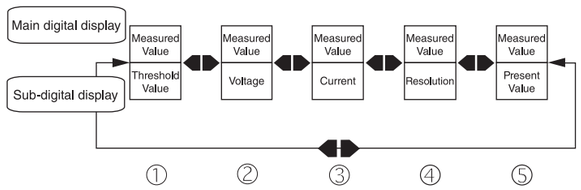
The alphabet appears on the digital display as shown in the following table.

A	b	c	d	E	F	G	h	I	J
K	L	m	n	o	P	q	r	S	t
U	v	w	X	Y	Z				

Operations in Run Mode

Mode	Mode Switch
RUN Mode	RUN T FUN

The RUN mode flow is shown below.



Suitability for Use

THE PRODUCTS CONTAINED IN THIS SHEET ARE NOT SAFETY RATED. THEY ARE NOT DESIGNED OR RATED FOR ENSURING SAFETY OF PERSONS, AND SHOULD NOT BE RELIED UPON AS A SAFETY COMPONENT OR PROTECTIVE DEVICE FOR SUCH PURPOSES. Please refer to separate catalogs for OMRON's safety rated products.

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of the products in the customer's application or use of the product.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used.
Know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
See also Product catalog for Warranty and Limitation of Liability.

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