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**OMRON**

## E3X-DA-S

Digital Fiber Sensors



Perfection Transcended!  
A Wealth of Advanced Functions  
for Easy and Reliable Application



**Innovation  
in the Solution Age**

OMRON INDUSTRIAL AUTOMATION

# Evolution and Perfection

The next-generation platform for a wide range of sensing

- point 1 The industry's first **Power Tuning Function** in a digital sensor.
- point 2 Large, **Easy-to-Read Displays** that are clear even from a distance. Seven convenient display formats.
- point 3 Stable long-term performance achieved with **OMRON's Auto Power Control (APC)** function.
- point 4 A wide array of **Advanced Functions** for even more applications.
- point 5 The same **Ease-of-Use** as the E3X-DA-N Amplifier.
- point 6 **Environmentally Friendly** design.
- point 7 Improved **Mobile Console**.



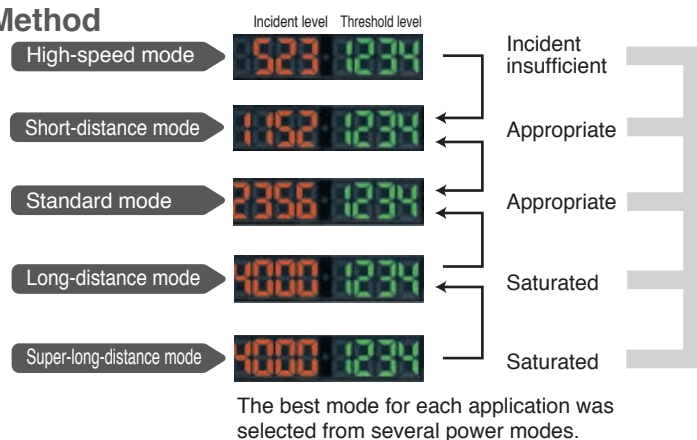
## Industry's First Power Tuning Function in a Digital Sensor.

## No complicated mode settings.

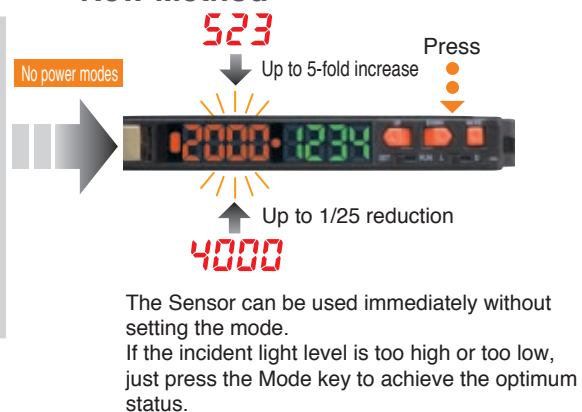
Troublesome power adjustments have been eliminated, so it isn't necessary to select from power mode settings, such as long-distance mode, standard mode, and short-distance mode. When the MODE Key is pressed once, the power tuning function shifts the power level so that the present incident level is set to the ideal level (2000 on the digital display.)

Patent Pending

## Earlier Method

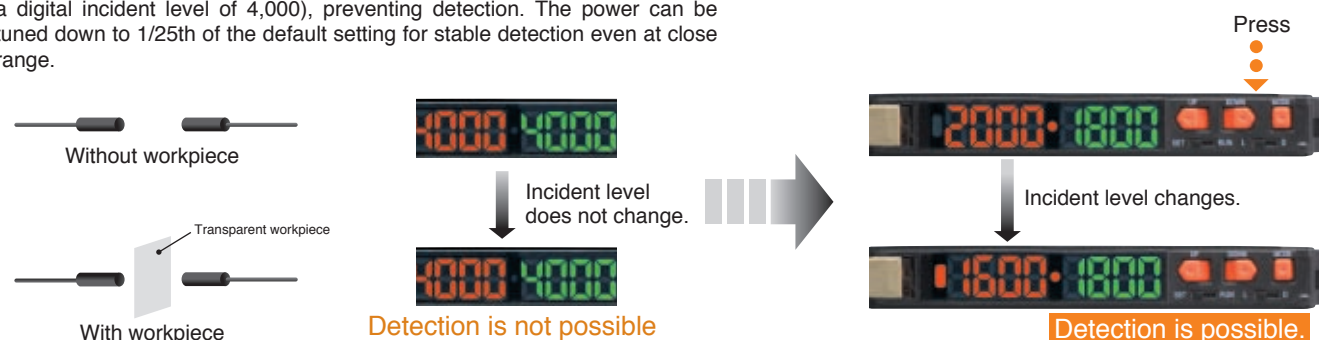


## New Method



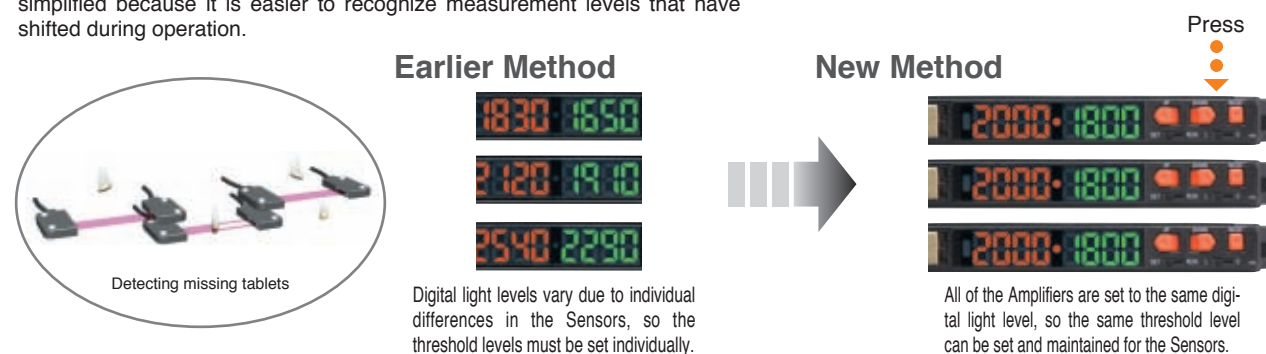
**Insufficient light or saturation at short distances can be corrected.**

The power tuning range is extended to the allowable limits to eliminate problems such as insufficient light or detection failures due to saturation. If the installation distance is too short, the incident light may saturate (i.e., to a digital incident level of 4,000), preventing detection. The power can be tuned down to 1/25th of the default setting for stable detection even at close range.



## Variations between different Sensors can be eliminated.

Threshold levels had to be set and maintained separately for individual Sensors due to variations in the digital light levels measured by each Sensor. With power tuning, the incident level can be fine-tuned so the same threshold level can be set for each Sensor in an application. Maintenance is also simplified because it is easier to recognize measurement levels that have shifted during operation.



## Large, Easy-to-Read Displays: Clear Even from a Distance

The displays are large and easy-to-read, despite the small case.

Settings can be made more simply and confidently with two digital displays. For example, the threshold value can be changed while reading the incident level or a setting can be changed while confirming the setting's function item number.

Large, bright  
operation indicator  
(like earlier models)

Incident level  Threshold level 

Industry's largest characters: 6 mm (like earlier models)

- Power tuning indicator added to indicate setting status.

**RUN mode**

**SET mode**

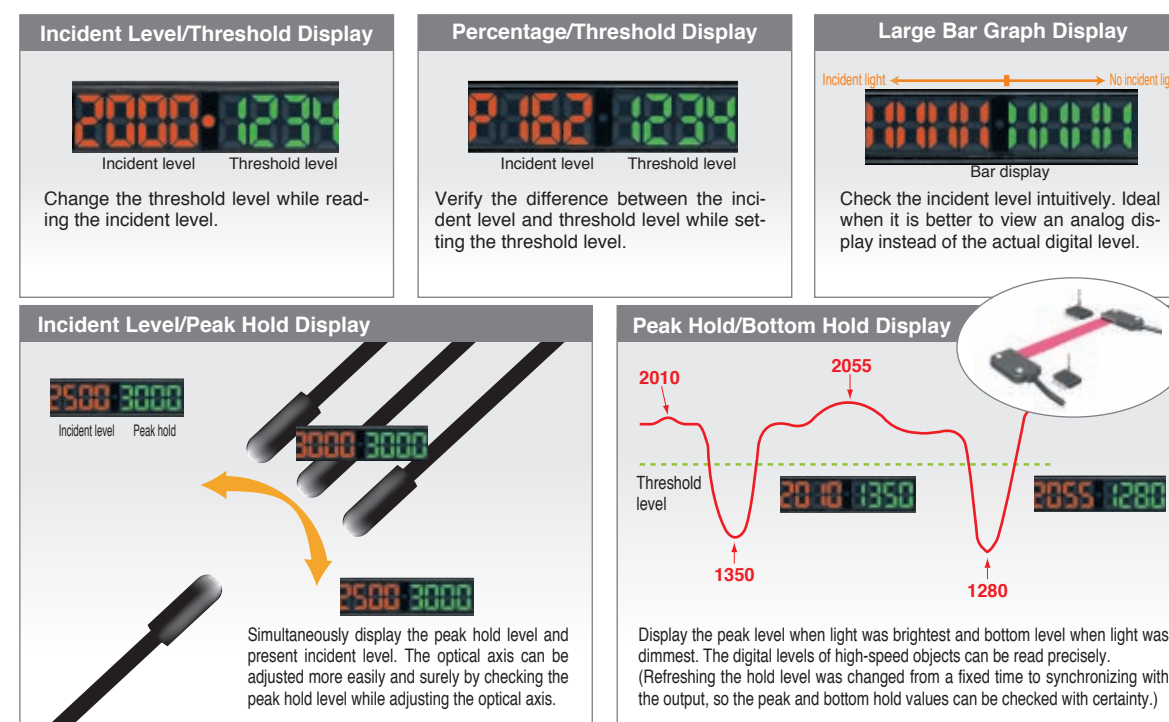
Function numbers  
added to function  
items.

Settings are now reversible.

## Seven Convenient Display Formats

Patent Pending

An incident level/threshold display, percentage/threshold display, and large bar graph display have been added, so you can select the best display method for the application.



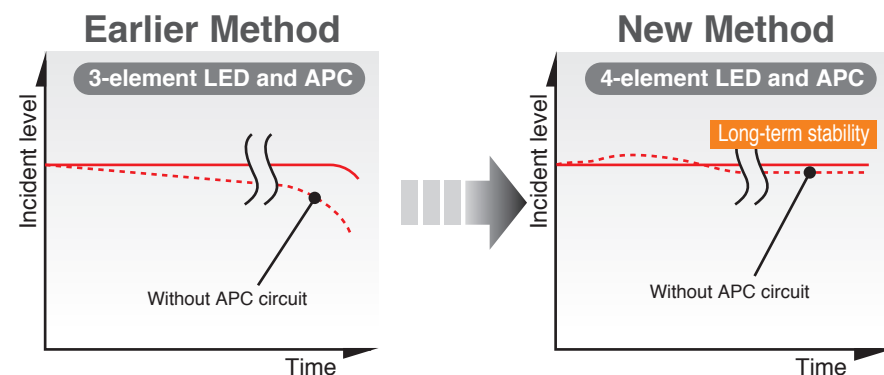


## Stable, Long-term Performance with OMRON's APC Function

**OMRON provides the industry's most stable long-term detection** Highest Level of Stability **by using new 4-element LEDs and an APC (Auto Power Control) circuit.**

In addition to our unique APC circuit used in the E3X-DA-N Amplifiers to compensate for the deterioration of the LED, the E3X-DA-S uses 4-element LEDs to counteract the deterioration of the light-emitting elements over time and achieve the industry's most stable long-term detection performance.

Furthermore, the circuit is designed with excess light capacity, so the Sensors can be used with high stability regardless of whether the APC circuit is ON or OFF.



**Compensate for the effects of contaminants and temperature variation with differential operation mode. (Advanced Models)**

This operation mode uses a special OMRON algorithm to compensate for slight light level changes due to dirt or temperature variations and detect only the light level changes due to the workpiece.

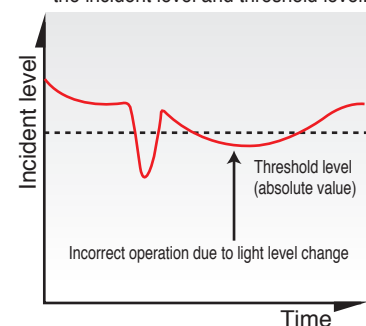
Slight light level changes can be detected with stability and precision, eliminating the need for time-consuming manual adjustments for light level changes.

With the Twin-output Amplifiers, output 2 can function as an alarm output (light level operation) to indicate when the light level has changed due to dirt or other causes.

Patent Pending

### Light Level Operation (Normal Operation)

Judges light level changes by comparing the incident level and threshold level.

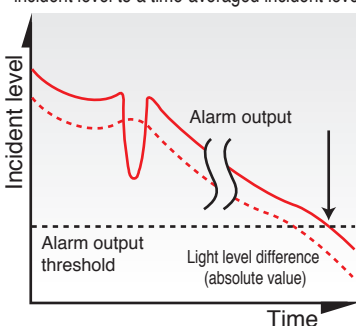


The light level varies due to dirt, temperature variations, or other environmental factors.

**Incorrect operation**

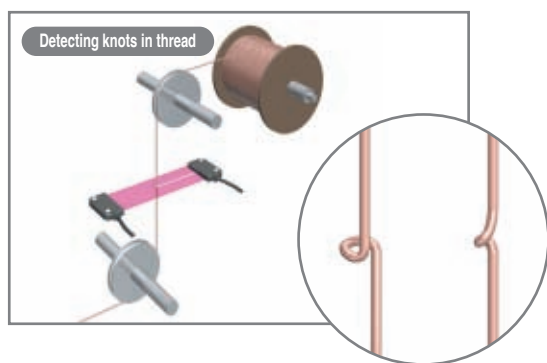
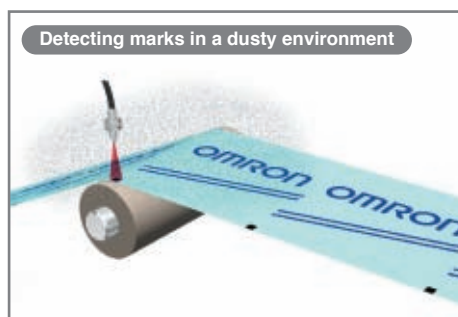
### Differential Operation

Judges light level changes by comparing the incident level to a time-averaged incident level.



Detecting differences in the light level enables setting more subtle light level differences.

**Minute changes are detected reliably.**



## Many Advanced Functions for Even More Applications

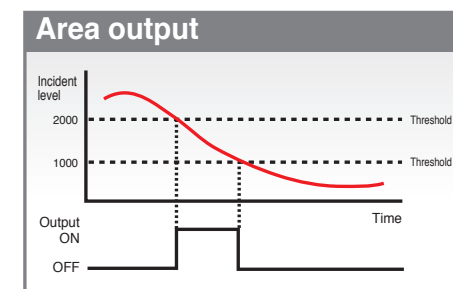
**In super-high-speed mode, it is the fastest digital model at 48  $\mu$ s. (Standard Models)** Fastest in the Industry

Provides high-speed response for miniature workpieces, such as chip parts and devices with short tact times.

**Three kinds of timer functions are supported. The timers can be set between 1 ms and 5 s.**  
A one-shot timer is supported in addition to the ON-delay and OFF-delay timers.  
The Amplifier's ON time can be fixed, which is useful during high-speed workpiece detection.

**Area output function can be used for range judgement. (Advanced Twin-output Models)**

Operations that required multiple Sensors, such as height measurement, can be performed with just one Sensor. Two threshold levels can be set to easily output within-range and out-of-range outputs.

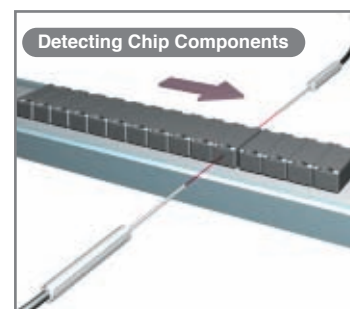
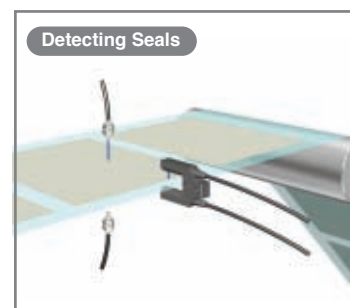
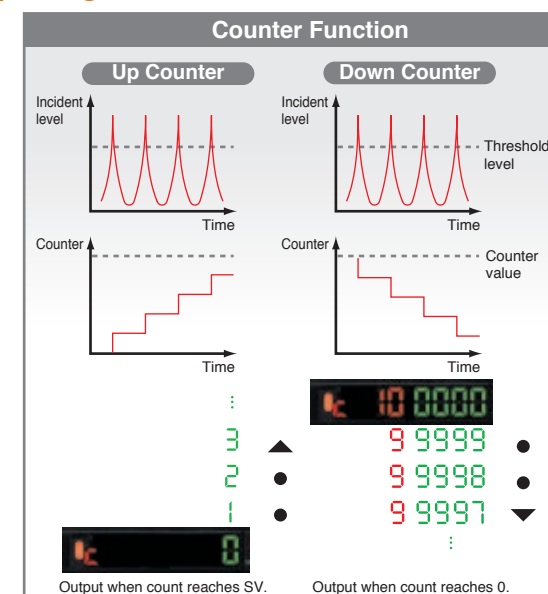


**Remote input function can control the Sensor remotely. (Advanced External-input Models)**

Input signals can make various remote settings, such as teaching operations, power tuning, and emitter OFF. This model is ideal for diverse needs, such as checking Sensor operation remotely before operation or making settings remotely because teaching has to be performed often for frequent workpiece model changes.

**The counter function can output signal after counter counts up or down. (Advanced External-input Models)** Patent Pending

A counter function is built-in, so the number of workpieces can be counted without a separate counter or small PLC that used to be required.



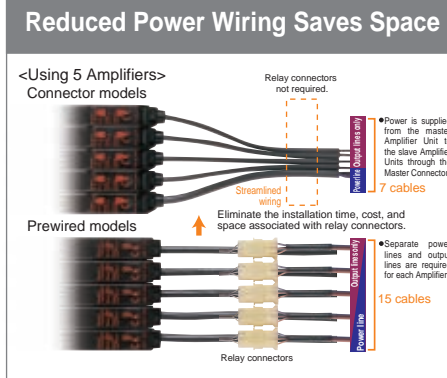
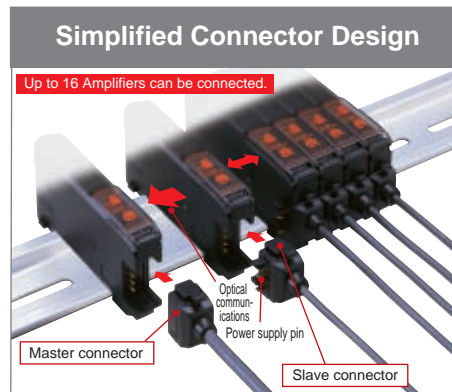
## The Same Ease-of-Use as the E3X-DA-N

The E3X-DA-S uses OMRON's own simplified wiring connectors that were introduced with the E3X-DA-N.

Patent Pending  
Japan patent number 3266198

In Amplifiers with Connectors, the power supply is distributed to slave connectors through a single master connector. This design has three major advantages.

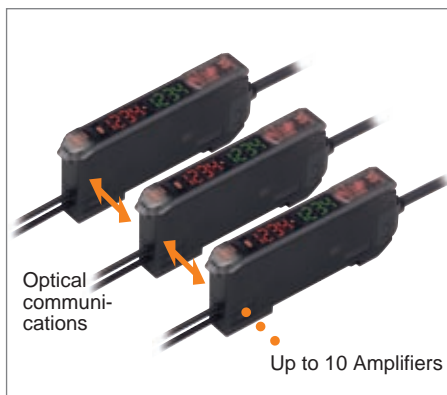
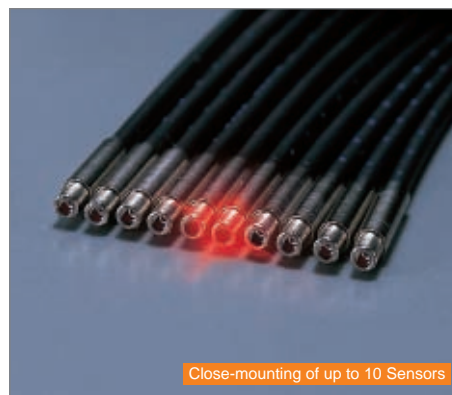
1. Wiring time is significantly reduced.
2. Relay connectors are unnecessary, so wiring takes up less space.
3. Storage and maintenance are simpler because it isn't necessary to distinguish between master connector and slave connectors on the Amplifier.



Optical communications prevents mutual interference.

Mutual interference is prevented with optical communications, so up to 10 Amplifiers can be mounted together.

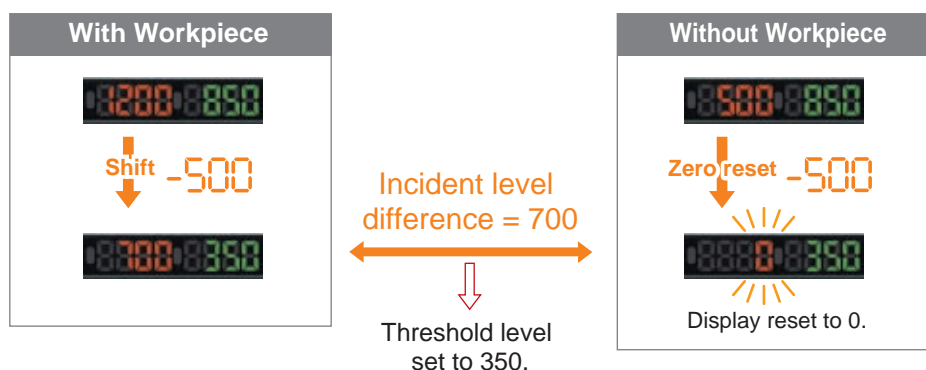
(The number of Amplifiers depends on the operating conditions.)



Zero reset function immediately resets the digital display to 0.

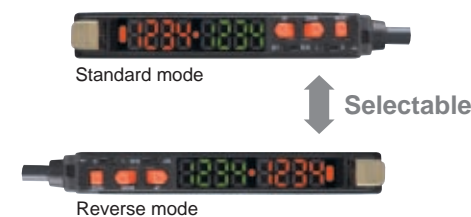
Patent Pending  
Japan patent number 3255229

The zero reset function can immediately reset the digital display to 0 at any time. By setting the reference value to 0, the threshold value can be set while monitoring differences in incident light levels. The threshold value will also shift simultaneously when the zero reset button is pressed.



Reversible Digital Display (Reverse Mode)

The digital display can be reversed to match the Amplifier's mounting direction.

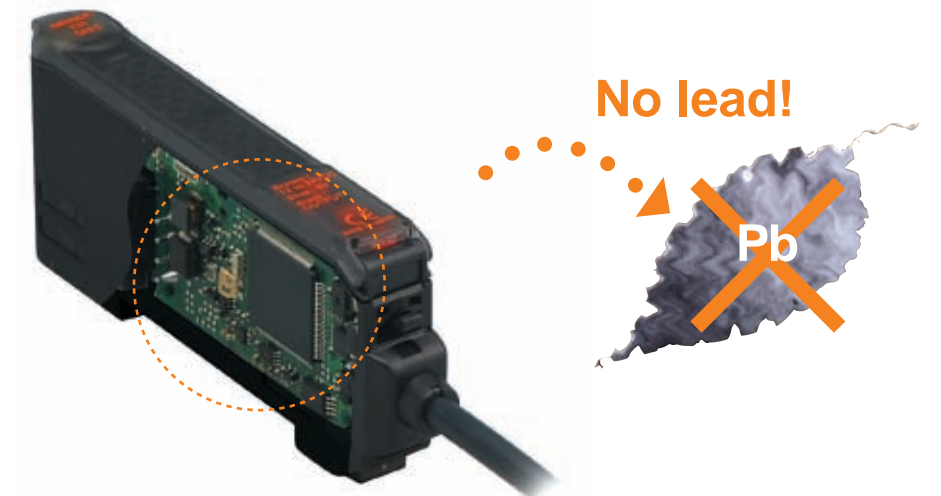


## Environmentally Friendly Design

Environmentally friendly features are essential in truly high-performance products.

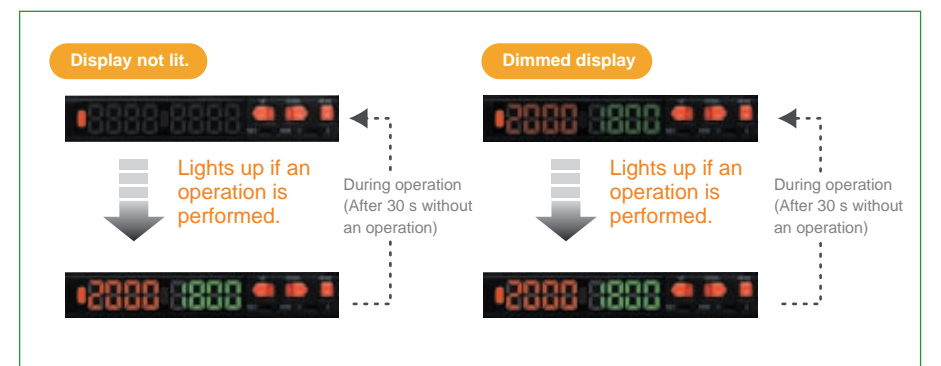
### 1 Materials containing lead have been completely eliminated. First in the industry

The Fiber Sensor is the first in the industry to use environmentally friendly lead-free solder.



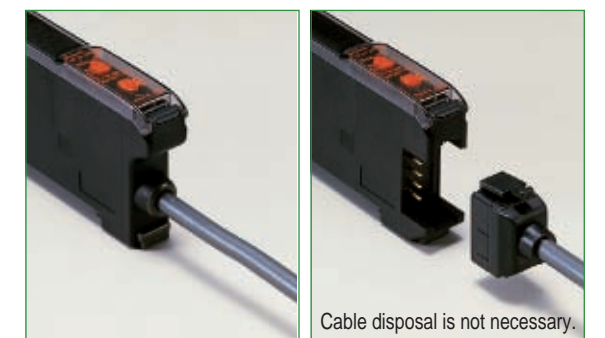
### 2 The digital display can be turned OFF or dimmed during operation. Eco-mode

When the digital display is viewed infrequently during operation, current consumption can be reduced by dimming the display or turning it OFF entirely. The display will light up again automatically when an operation key is touched. (Eco-mode can be set from the Mobile Console only.)



### 3 Cable disposal is not required during maintenance.

In addition to saving space and reducing wiring time, the new connector design eliminates the need to dispose of cables together with the Amplifiers.





## Further Improvements to the Mobile Console



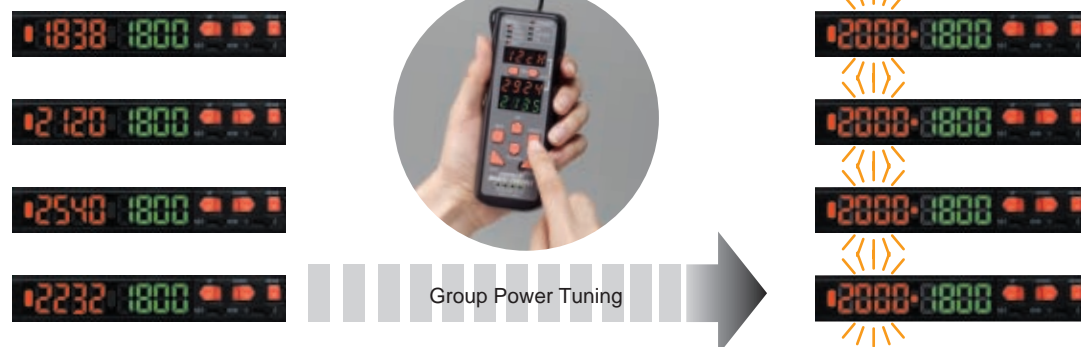
Can also be used with Photoelectric Sensors with Separate Digital Amplifiers.



E3C-LDA  
Photoelectric Sensor with Separate Digital Amplifier

### Group Power Tuning

With the group power tuning function, power tuning is possible for multiple Sensors at the same time.



*Easily set multiple Sensors.*

### Improved Mode Lock Function

Settings can be customized for different applications by locking out unnecessary function blocks within function settings.

Application		Function Block		
		Manual setting	Teaching	Function setting
Manual	Set for manual operation.	Operation OK	Locked	Locked
Teaching	Set for teaching operation.	Locked	Operation OK	Locked
Teaching +  Manual	Set for teaching + manual operation.	Operation OK	Operation OK	Locked

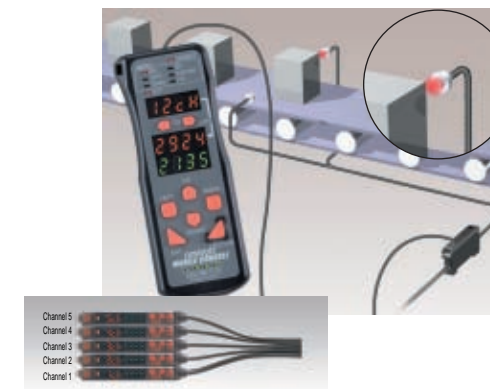
*The Age of User-customizable Sensors.*

Retains all of the Previous Advantages of the Mobile Console.

*New and Improved Fiber Sensor and Mobile Console.*

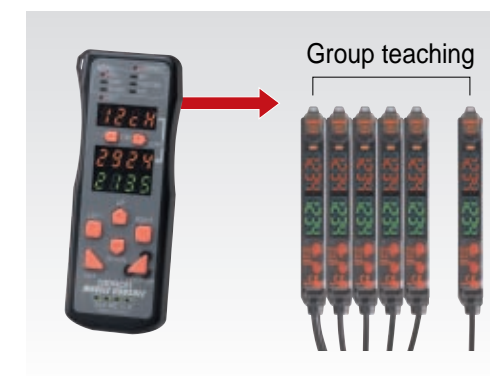
### Settings, teaching, and fine-tuning can be performed at the fiber tip.

The Mobile Console can be used for settings and teaching at the tip of the fiber. Difficult adjustments can be made while checking the workpiece position. Even if the Amplifier and Sensor head are separated during operation, it is still possible to flash the Sensor head and display the amplifier channels.



### With Group Teaching, Teach Multiple Amplifiers Simultaneously.

The tedious teaching that had to be performed separately for each Amplifier can now be performed for several Amplifiers at once using the Mobile Console.



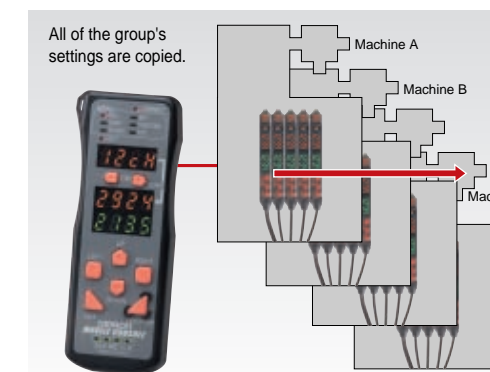
### Copying Settings within the Same Group

Settings such as mode or threshold settings in an Amplifier or bank can be copied to all of the Amplifiers in the same group.



### Copying Settings to Other Groups

The settings for a group of Amplifiers on one machine can be copied to a group of Amplifiers on another machine. (The settings can also be copied to and from banks.)



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In the interest of product improvement, specifications are  
subject to change without notice.

This document provides information mainly for selecting  
suitable models. Please read the Instruction Sheet  
carefully for information that the user must understand  
and accept before purchase, including information on  
warranty, limitations of liability, and precautions.

Cat. No. E335-E1-01A

Printed in Japan  
0704-1M (1202) (O)



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