KnowledgeBase
Technote ID# 808531

Sensing, Safety and Connectivity Business
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Created: March 31st 2016
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Product Line: 42EF RightSight

Bulletin Numbers: 42EF-D*, 42EF-P*, 42EF-E* and 42EF-R*

Subject: 42EF RightSight Polarized Retroreflective, Diffuse and Transmitted Beam Series Change – Series D

Overview:

Rockwell Automation is embedding IO-Link 1.1 protocol in specific sensing modes of the 42EF RightSight family. IO-Link is a point to point communications protocol that provides users with additional sensor diagnostics when connected to an IO-link master. The sensors work as standard devices when connected to regular IO cards and operate in IO-Link only when connected to IO-Link master. IO—Link is not another field bus and no special cable or media is needed to communicate with IO-Link enabled devices.

These enhancements add value to customers in critical applications where additional diagnostics are needed to prevent downtime and future-proof machines for the Connected Enterprise. Series D product cost and sensing performance is not impacted by the addition of IO-Link 1.1 as part of the standard offering.

The 42EF RightSight sensing modes listed on Table 1 will start transitioning to Series D on the specific highlighted dates**.** The following models will **NOT** be transitioning to Series D and will continue to be offered in their respective previous series (B or C) until further notice:

- Sharp Cutoff Diffuse
- Large Aperture Fiber Optic
- Background Suppression
- Laser Models
- All AC Sensing Modes

Table 1 – 42EF RightSight Polarized Retro, Diffuse and Transmitted Beam Catalog Numbers

Catalog Numbers	Discontinuation Date
42EF-D1JBAK-A2	3/31/2016 - Transitioned
42EF-D1JBAK-F4	3/31/2016 - Transitioned
42EF-D1JBAK-Z20	3/31/2016 - Transitioned
42EF-D1JBAK-Z31	3/31/2016 - Transitioned
42EF-D1KBAK-A2	3/31/2016 - Transitioned
42EF-D1KBAK-F4	3/31/2016 - Transitioned
42EF-D1MNAK-A2	3/31/2016 - Transitioned
42EF-D1MNAK-F4	3/31/2016 - Transitioned
42EF-D1MNAK-Y4	3/31/2016 - Transitioned
42EF-D1MPAK-A2	3/31/2016 - Transitioned
42EF-D1MPAK-A5	3/31/2016 - Transitioned
42EF-D1MPAK-F4	3/31/2016 - Transitioned
42EF-D1MPAK-Y4	3/31/2016 - Transitioned
42EF-R9JBB-A2	**9/30/2016**①
42EF-R9JBB-F4	**9/30/2016**①
42EF-R9JBBT-A2	**9/30/2016**①
42EF-R9JBBT-F4	**9/30/2016**①
42EF-R9KBB-A2	**9/30/2016**①
42EF-R9KBB-F4	**9/30/2016**①
42EF-R9KBB-Z31	**9/30/2016**①
42EF-R9KBBT-F4	**9/30/2016**①
42EF-R9MNB-A2	**9/30/2016**①
42EF-R9MNB-F4	**9/30/2016**①
42EF-R9MNB-Y4	**9/30/2016**①
42EF-R9MPB-A2	**1/31/2017**①
42EF-R9MPB-A5	**9/30/2016**①
42EF-R9MPB-F4	**1/31/2017**①
42EF-R9MPB-Y4	**1/31/2017**①

Catalog Numbers	Discontinuation Date
42EF-P2JBB-A2	7/15/2015 - Transitioned
42EF-P2JBB-F4	7/15/2015 - Transitioned
42EF-P2KBB-A2	7/15/2015 - Transitioned
42EF-P2KBB-F4	7/15/2015 - Transitioned
42EF-P2MNB-A2	7/15/2015 - Transitioned
42EF-P2MNB-F4	7/15/2015 - Transitioned
42EF-P2MNB-Y4	7/15/2015 - Transitioned
42EF-P2MNB-Z15	7/15/2015 - Transitioned
42EF-P2MPB-A2	7/15/2015 - Transitioned
42EF-P2MPB-A5	7/15/2015 - Transitioned
42EF-P2MPB-F4	7/15/2015 - Transitioned
42EF-P2MPB-Y4	7/15/2015 - Transitioned
42EF-R9MNBT-A2	**NOT DEFINED**❷
42EF-R9MNBT-F4	**NOT DEFINED**❷
42EF-R9MPB-A6	**1/31/2017**①
42EF-R9MPBT-A2	**9/30/2016**①
42EF-R9MPBT-A5	**1/31/2017**①
42EF-R9MPBT-F4	**9/30/2016**①
42EF-R9MPBT-Y4	**9/30/2016**①
42EF-E1EZB-A2	**1/31/2017**①
42EF-E1EZB-A5	**1/31/2017**①
42EF-E1EZB-F4	**NOT DEFINED**❷
42EF-E1EZB-Y4	**1/31/2017**①
42EF-E1EZB-Z31	**1/31/2017**①
42EF-E1EZB-A6	**1/31/2017**①
42EF-E1EZB-A10	**1/31/2017**①
42EF-E1EZB-A13	**1/31/2017**①

① Final discontinuation date. After this date, the new Series D catalog number shown on Table 2 should be ordered instead pending inventory use-up.

❷ Catalog No. is restricted and not available for sales to the general public. **Customers should migrate** to the new 42EF Series D product listed on Table 2. Refer to Item #9 for backwards compatibility information on this specific part number. If you still need additional information, please contact Product Manager with regards to these catalog numbers.

Required Action: Notify existing and new 42EF RightSight customers about the upcoming change with the introduction of Series D models. The sensing performance is not impacted with the introduction of the new models however some customers may need to update their documentation to reflect the correct catalog number configuration for the new Series.

Refer to Table 2 for recommended Series D replacements for the parts listed above.

Table 2 – 42EF RightSight Polarized Retroreflective, Diffuse and Transmitted Beam Cross Reference to Series D Catalog Numbers.

Description	42EF RightSight Part Numbers Being Replaced	Type of Change	42EF RightSight Series D Replacements Available For Sale NOW
42EF RightSight Diffuse	42EF-D1JBAK-A2	Catalog No. Change❶	42EF-D2JBAK-A2
42EF RightSight Diffuse	42EF-D1JBAK-F4	Catalog No. Change❶	42EF-D2JBAK-F4
42EF RightSight Diffuse	42EF-D1JBAK-Z20	Catalog No. Change❶	42EF-D2JBAK-Z20
42EF RightSight Diffuse	42EF-D1JBAK-Z31	Catalog No. Change❶	42EF-D2JBAK-Z31
42EF RightSight Diffuse	42EF-D1KBAK-A2	Catalog No. Change❶	42EF-D2KBAK-A2
42EF RightSight Diffuse	42EF-D1KBAK-F4	Catalog No. Change❶	42EF-D2KBAK-F4
42EF RightSight Diffuse	42EF-D1MNAK-A2	Catalog No. Change❶	42EF-D2MNAK-A2
42EF RightSight Diffuse	42EF-D1MNAK-F4	Catalog No. Change❶	42EF-D2MNAK-F4
42EF RightSight Diffuse	42EF-D1MNAK-Y4	Catalog No. Change❶	42EF-D2MNAK-Y4
42EF RightSight Diffuse	42EF-D1MPAK-A2	Catalog No. Change❶	42EF-D2MPAK-A2
42EF RightSight Diffuse	42EF-D1MPAK-A5	Catalog No. Change❶	42EF-D2MPAK-A5
42EF RightSight Diffuse	42EF-D1MPAK-F4	Catalog No. Change❶	42EF-D2MPAK-F4
42EF RightSight Diffuse	42EF-D1MPAK-Y4	Catalog No. Change❶	42EF-D2MPAK-Y4
42EF RightSight Transmitted Beam Receiver	42EF-R9JBB-A2	Catalog No. Change❶	42EF-R2JBB-A2
42EF RightSight Transmitted Beam Receiver	42EF-R9JBB-F4	Catalog No. Change❶	42EF-R2JBB-F4
42EF RightSight Transmitted Beam Receiver	42EF-R9JBBT-A2	Catalog No. Change❶	42EF-R2JBBT-A2
42EF RightSight Transmitted Beam Receiver	42EF-R9JBBT-F4	Catalog No. Change❶	42EF-R2JBBT-F4
42EF RightSight Transmitted Beam Receiver	42EF-R9KBB-A2	Catalog No. Change❶	42EF-R2KBB-A2
42EF RightSight Transmitted Beam Receiver	42EF-R9KBB-F4	Catalog No. Change❶	42EF-R2KBB-F4
42EF RightSight Transmitted Beam Receiver	42EF-R9KBB-Z31	Catalog No. Change❶	42EF-R2KBB-Z31
42EF RightSight Transmitted Beam Receiver	42EF-R9KBBT-F4	Catalog No. Change❶	42EF-R2KBBT-F4
42EF RightSight Transmitted Beam Receiver	42EF-R9MNB-A2	Catalog No. Change❶	42EF-R2MNB-A2
42EF RightSight Transmitted Beam Receiver	42EF-R9MNB-F4	Catalog No. Change❶	42EF-R2MNB-F4
42EF RightSight Transmitted Beam Receiver	42EF-R9MNB-Y4	Catalog No. Change❶	42EF-R2MNB-Y4
42EF RightSight Transmitted Beam Receiver	42EF-R9MPB-A2	Catalog No. Change❶	42EF-R2MPB-A2
42EF RightSight Transmitted Beam Receiver	42EF-R9MPB-A5	Catalog No. Change❶	42EF-R2MPB-A5
42EF RightSight Transmitted Beam Receiver	42EF-R9MPB-F4	Catalog No. Change❶	42EF-R2MPB-F4
42EF RightSight Transmitted Beam Receiver	42EF-R9MPB-Y4	Catalog No. Change❶	42EF-R2MPB-Y4
42EF RightSight Transmitted Beam Receiver	42EF-R9MNBT-A2	Catalog No. Change❶	42EF-R2MNBT-A2
42EF RightSight Transmitted Beam Receiver	42EF-R9MNBT-F4	Catalog No. Change❶	42EF-R2MNBT-F4
42EF RightSight Transmitted Beam Receiver	42EF-R9MPB-A6	Catalog No. Change❶	42EF-R2MPB-A6
42EF RightSight Transmitted Beam Receiver	42EF-R9MPBT-A2	Catalog No. Change❶	42EF-R2MPBT-A2
42EF RightSight Transmitted Beam Receiver	42EF-R9MPBT-A5	Catalog No. Change❶	42EF-R2MPBT-A5
42EF RightSight Transmitted Beam Receiver	42EF-R9MPBT-F4	Catalog No. Change❶	42EF-R2MPBT-F4
42EF RightSight Transmitted Beam Receiver	42EF-R9MPBT-Y4	Catalog No. Change❶	42EF-R2MPBT-Y4
42EF RightSight Transmitted Beam Emitter	42EF-E1EZB-A2	Catalog No. Change❶	42EF-E2EZB-A2

42EF RightSight Transmitted Beam Emitter	42EF-E1EZB-A5	Catalog No. Change❶	42EF-E2EZB-A5
42EF RightSight Transmitted Beam Emitter	42EF-E1EZB-F4	Catalog No. Change❶	42EF-E2EZB-F4
42EF RightSight Transmitted Beam Emitter	42EF-E1EZB-Y4	Catalog No. Change❶	42EF-E2EZB-Y4
42EF RightSight Transmitted Beam Emitter	42EF-E1EZB-Z31	Catalog No. Change❶	42EF-E2EZB-Z31
42EF RightSight Transmitted Beam Emitter	42EF-E1EZB-A6	Catalog No. Change❶	42EF-E2EZB-A6
42EF RightSight Transmitted Beam Emitter	42EF-E1EZB-A10	Catalog No. Change❶	42EF-E2EZB-A10
42EF RightSight Transmitted Beam Emitter	42EF-E1EZB-A13	Catalog No. Change❶	42EF-E2EZB-A13
42EF RightSight Polarized Retroreflective	42EF-P2JBB-A2	Series Change❷	42EF-P2JBB-A2
42EF RightSight Polarized Retroreflective	42EF-P2JBB-F4	Series Change❷	42EF-P2JBB-F4
42EF RightSight Polarized Retroreflective	42EF-P2KBB-A2	Series Change❷	42EF-P2KBB-A2
42EF RightSight Polarized Retroreflective	42EF-P2KBB-F4	Series Change❷	42EF-P2KBB-F4
42EF RightSight Polarized Retroreflective	42EF-P2MNB-A2	Series Change❷	42EF-P2MNB-A2
42EF RightSight Polarized Retroreflective	42EF-P2MNB-F4	Series Change❷	42EF-P2MNB-F4
42EF RightSight Polarized Retroreflective	42EF-P2MNB-Y4	Series Change❷	42EF-P2MNB-Y4
42EF RightSight Polarized Retroreflective	42EF-P2MNB-Z15	Series Change❷	42EF-P2MNB-Z15
42EF RightSight Polarized Retroreflective	42EF-P2MPB-A2	Series Change❷	42EF-P2MPB-A2
42EF RightSight Polarized Retroreflective	42EF-P2MPB-A5	Series Change❷	42EF-P2MPB-A5
42EF RightSight Polarized Retroreflective	42EF-P2MPB-F4	Series Change❷	42EF-P2MPB-F4
42EF RightSight Polarized Retroreflective	42EF-P2MPB-Y4	Series Change❷	42EF-P2MPB-Y4

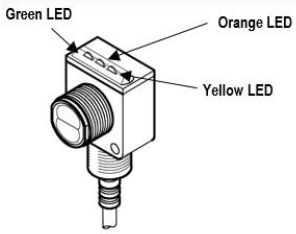
❶ Catalog number changed due to transition from Infrared LED to visible Red LED. This change may require customers to update their documentation to reflect the new part number. Change is from 42EF-D1* to 42EF-D2* on Diffuse Models, 42EF-E1* to 42EF-E2* on Transmitted Beam Emitters and 42EF-R9* to 42EF-R2* for Transmitted Beam Receivers. Refer to Item #9 on this document for information about backwards compatibility on Transmitted Beam Products.

❷ Series Change from previous series to Series D does not impact catalog because the LED was already visible red. No impact to customer documentation.

The features listed below are different from previous series.

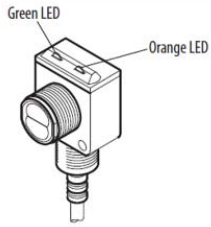
1. User Interface (LED Indication)
2. Output short circuit indication
3. Visible red light source for Diffuse and Transmitted Beam to aid with alignment
4. Linear Potentiometer Adjustment for Diffuse and Sharp Cutoff Models
5. Improved High Frequency Ballast Immunity
6. IO-Link 1.1 enabled enables enhanced sensor diagnostics to help minimize downtime.
7. Series Connection Output Wiring
8. Changes in the adjustment of sensitivity are saved only when sensor is powered
9. Transmitted Beam Backwards Compatibility with Previous Models

1. User Interface (All Series D Sensing Modes)



Previous Series

LED Color	Description
Yellow	Output/Short Circuit
Orange	Margin Indication
Green	Sensor Power



42EF Series D

LED Color	Description
Orange	Output
Green	Power/Margin

Label	Color	State	Sensor Status
Output	Yellow	OFF	Output de-energized
		ON	Output energized
		Flashing	Output Short circuit Protection(active)
Margin	Orange	OFF	Margin < 2.5
		ON	Margin > 2.5
		Flashing	Output Short circuit Protection(active)
Status	Green	OFF	Sensor OFF, Output Active, SCP Active
		ON	Sensor Power ON

Label	Color	State	Sensor Status
Power Margin IO-Link*	Green	OFF	Power is OFF
		ON	Power is ON
		Flashing (6 hertz)	Unstable light: 0.8x < margin < 1.5x
		Flashing (1.4 hertz)	Output Short Circuit Active
Output	Orange	OFF	Output is OFF
		ON	Output is ON

*when connected to an IO-Link Master, the green LED will flash at 1 hertz rate to indicate a successful connection.

The 42EF RightSight Series D incorporates a significant change in the user interface by migrating from 3 LEDs (Green, Orange and Red) to two LEDs (Green and Orange). The driver for this change is the need to improve the customer experience by standardizing and creating uniformity on how sensor diagnostic information is displayed across multiple photoelectric product families. This new LED indication provides the same interface experience as the 42JS VisiSight, 42JT VisiSight and 42CA photoelectric sensors.

This new interface also provides additional margin indication to help customers optimize the sensor for the application.

2. Short Circuit Indication (All Series D Sensing Modes)

For the Series D is different than previous Series. In previous series, short circuit was indicated by the yellow and orange LEDs while in the 42EF Series D, the green LED is used to display this condition. This LED will flash at a slower rate (1.4 Hz) whenever a short circuit condition is present.

3. Visible Red Light Source (Diffuse and Transmitted Beam)

42EF Series D now offers visible red LED in Diffuse, Sharp Cutoff Models and Transmitted Beam. The visible beam helps customers ensure sensor operation and greatly facilitate alignment when installing the sensor in the application

4. Linear Potentiometer Adjustment (Models with Potentiometer Adjustment)

42EF Series D Diffuse and Sharp Cutoff sensors now offer linear sensitivity adjustment. This means that the reduction or increase in range is proportional to the turn of the adjustment knob. For example, if you turn the knob down by ¼, the reduction in range will be roughly ¼ shorter.

This is a significant improvement over previous series since a slight variation in the adjustment drastically affected the sensing range.

5. Improved High Frequency Ballast Immunity

High frequency ballast used for illumination in the industrial floor could cause sensors to falsely trigger in applications where the devices may be directed towards the ceiling or there is a direct incidence of light.

The 42EF Series D sensors incorporates improved resistance against high frequency ballast to ensure reliable operation in the application.

6. Embedded IO-Link 1.1 (Future Proof your Machine)

The IO-Link technology is an open point-to-point communication standard and was launched as (IS) IEC 61131-9. IO-Link is now the first globally standardized technology for sensor and actuator communication with a field bus system.

IO-Link communication is based on a master-slave structure in which the master controls the interface access to the sensor. The option of using the intelligence that is integrated into the sensor provides the user with new commissioning methods. Benefits range from reduced installation time during startup to increased diagnostics over the lifetime of the machine.

Benefits of IO-Link technology include:

- Reduced inventory and operating costs
- Increased uptime/productivity
- Simplified design, installation, set up and maintenance
- Enhanced flexibility and scalability
- Detailed diagnostic information for preventative maintenance

7. Series Connection Output Wiring

In the 42EF Series D sensors, connecting sensors in Series is limited to a maximum of one sensor per output when using Pin 4 (black wire). This limitation is inherent to the implementation of IO-Link in our sensors. There are no limitations when connecting pin 2(white) to multiple sensors as long as the power consumption of the device is below the maximum current that the sensor can output.

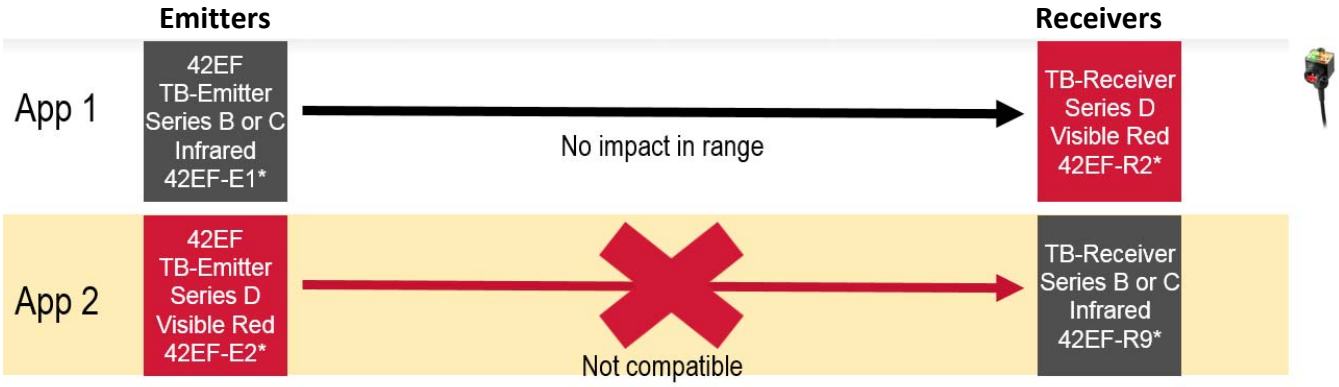
To address customer applications where more than one sensor may be connected in series while using pin 4 (black), we have created special models where IO-Link is disabled. These models are the 42EF-D2MEAK-F4 for diffuse models, 42EF-P2MEB-F4 for Polarized Retroreflective and 42EF-R2MEB-F4. These sensors will be available for sale at the end of August 2016.

8. Changes in the Adjustment of Sensitivity

Current series sensors using an adjustment knob to reduce the sensing range allow users to change the sensitivity while the sensor was powered OFF. In other words, if you changed the sensitivity adjustment with the sensor powered OFF and then powered the sensor, the unit would immediately operate at the specified range set by the knob.

Since the sensitivity adjustment is electronically controlled in the 42EF Series D models, the sensor must be powered in order for the sensitivity settings to be saved.

9. Transmitted Beam Backwards Compatibility with Previous Models



T-Beam sensors are now visible red. This helps customers with alignment and ensure proper sensor operation. This improvement makes the **42EF T-Beam Ser. B or C** partially compatible with the Series D due light filtering designed to reject visible red light. This difference in light source does not impact sensor range, performance or response time.

- Replacement 42EF TB Emitter Ser. B or C from the field will work when operating in conjunction to a 42EF Series D Receiver **(App 1)**
- Replacement 42EF TB-Emitter Ser. D with 42EF TB-Receiver Ser. B or C, requires both sensors to be Series D. The customer will need to replace both units in the field. **(App 2)**

Similarities from previous Series to Series D.

1. **Sensing Range and Performance :** Sensor beam pattern and margin curves are similar to previous series
2. **Response Time:** Sensor response time is 1 ms for Diffuse and Polarized Retroreflective and 4 ms for Transmitted Beam.
3. **Environmental Protection:** Sensor is IP69K rated and 1200 PSI wash-down, same as the previous series

For additional information please contact:

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