

# Compact Non-Contact Radar

## 80 GHz Level Sensors

# **BINMASTER**

Level Sensors and Software



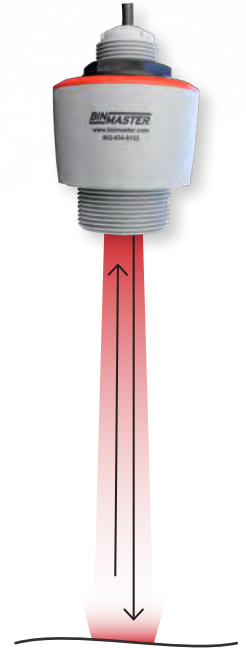
The CNCR series of compact non-contact radar level sensors uses 80 GHz narrow beam technology for accurate measurement in bins, tanks, or silos. They are easy to setup using Bluetooth on a phone and then send level measurement data to BinCloud<sup>®</sup> software, a local display, or a PLC. The sensors offer a measuring range up to 98 feet and install in existing vessel openings or non-intrusively when measuring levels in plastic vessels.

# How CNCR Works

The sensor transmits a continuous 80 GHz radar signal through the face of the antenna. The signal is reflected off the material surface and received as an echo by the antenna. The frequency difference between the sent and received signals is converted to a measurement that represents the distance to the material surface.

The distance is calculated based upon the vessel height programmed into the unit when it is set up. Setup can be performed without the vessel being emptied to save time.

The measurement output is the distance from the face of the antenna to the material surface. Measurements are displayed in inches, feet, or meters.



## 80 GHz Technology

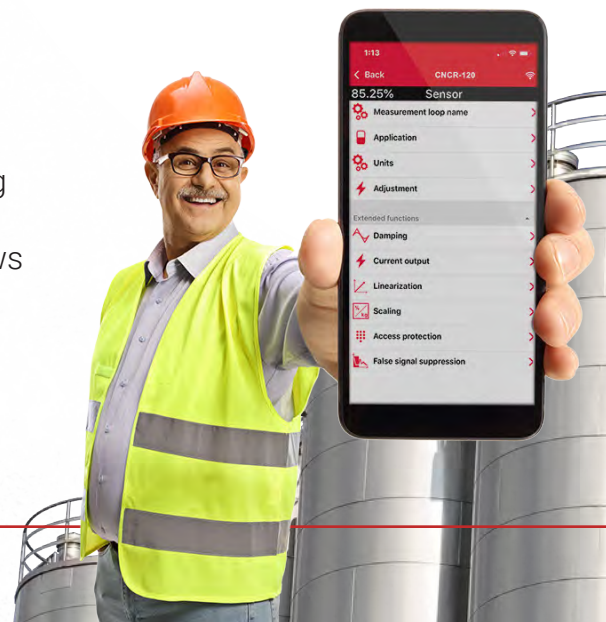
The CNCR family of radar level sensors is an alternative to using ultrasonic sensors or pressure transmitters to measure levels in bins, tanks, silos, or open-air applications. These sensors utilize 80 GHz technology that narrowly focuses the radar signal in an eight-degree beam angle. This technology is extremely reliable in dust, condensation, turbulence, and foam. The narrow beam can be used in confined vessels or standpipes and aimed to avoid structure that could interfere with the signal.

Non-contact radar technology delivers extremely high measurement accuracy of  $\pm 0.2$  inches. Measurements are not affected by changing process conditions such as fluctuating temperature or pressure.



## Bluetooth Simplifies Setup

CNCR sensors are set up using a Bluetooth app downloaded to a cell phone or tablet. Setup can also be done on a PC using a Bluetooth USB adapter. Viewing of level measurements and changes to bin parameters can be done via the app. This allows for level monitoring and parameter adjustments to be made without climbing tanks.





# Reliable Levels, Fast Updates

BinMaster's CNCR series of compact radar level sensors are used for non-contact level measurement of many types of materials of varying densities. These sensors are appropriate for use across many process industries in indoor and outdoor environments.

The continuous level sensors also reliably measure in excessive dust, humidity, steam, vapor, and are unaffected by noise. The 80 GHz technology performs accurately if condensation or moderate buildup occurs on the sensor face.

## Mounting the CNCR

The CNCR can be mounted using a wall-mounted bracket made of stainless steel that extends either 3.25 or 8.0 inches into the vessel. The wall-mounted bracket is offered with a 1.0 or 1.5-inch opening. A stainless-steel ceiling mounted bracket with a 1.5-inch opening is also available.



SWVL-40



730-0787



730-0788



Mounting Plate

If aiming is desired, select one of our 1.5-inch swivel mounts. All CNCR sensors except the CNCR-190 can also be used with a powder-coated, carbon steel 1.5-inch NPT mounting plate in 0°, 5°, 10°, and 30° angles. The CNCR-190 uses a 1.0-inch mounting plate.

## Choosing the Right Model

The model best suited to your application will be determined by the distance you need to measure and/or the height of the vessel, the type of material being measured, whether you need a 4-20 mA or Modbus output, and how you will mount the sensor.



CNCR 110/120



CNCR 130



CNCR 210/220



CNCR 190



CNCR 230

# Cabled Sensors

## 100 Series

The CNCR-110, 120, 130, and 190 all install using a polyurethane pigtail connection cable available in 16, 32, or 82-foot lengths. These sensors are rated to IP66/IP68 (3 bar) with housings made from durable PVDF material that has excellent chemical, abrasion, and flame resistance and UV stability. The FKM seal provides heat and chemical resistance for long-lasting durability. Most CNCR-100s are available with agency approvals for use in hazardous locations.



### CNCR-110

The 110 is the ideal sensor for non-contact level measurement at distances up to 26 feet in applications requiring a high level of environmental protection. It features a two-wire 4-20 mA output and is offered with either a 1.5-inch threaded or straight NPT connection. The cable outlet is on the top of the sensor. The CNCR-110 is offered only with a 32 foot connection cable. They are for use in unclassified areas, non-EX environments, and have general purpose FM/CSA/CE certifications.

### CNCR-120 and CNCR-130

The 120 and 130 sensors are suited for non-contact level measurement at distances up to 49 feet in applications requiring a high level of environmental protection. They are offered with either a two wire 4-20 mA or four wire Modbus output and a choice of a 1.5-inch threaded or straight NPT connection. The 120 model has the cable outlet on the top for mounting on the top of the vessel, whereas the 130 model has the cable outlet on the side. The 120 and 130 have general purpose FM/CSA/CE approvals for unclassified areas and is offered with a variety of hazardous location approvals.



### CNCR-190

The 190 model is for non-contact level measurement at distances up to 98 feet in applications where a high level of environmental protection from the elements is required. It is offered with either a two-wire 4-20 mA or four-wire Modbus output and features a 1.0-inch threaded or straight NPT connection. The cable outlet is on the top of the sensor. The 190 has general purpose FM/CSA/CE approvals for unclassified areas or are offered with a variety of hazardous location approvals for classified environments.



# CNCR 100 Series Specifications

CNCR-110



CNCR-120



CNCR-130



CNCR-190



## MODE OF OPERATION

|                            | CNCR-110                                     | CNCR-120  | CNCR-130                                      | CNCR-190                                      |
|----------------------------|--|---|---|---|
| <b>Measuring Principle</b> | Radar  | Radar   | Radar   | Radar   |
| <b>Measuring Range</b>     | 26 ft (8 M) liquids<br>12 ft (3.7 M) solids  | 49 ft (15 M) liquids<br>24 ft (7.3 M) solids  | 49 ft (15 M) liquids<br>24 ft (7.3 M) solids  | 98 ft (30 M) liquids<br>48 ft (14.6 M) solids |
| <b>Frequency</b>           | 80 GHz                                       | 80 GHz  | 80 GHz  | 80 GHz  |
| <b>Beam Angle</b>          | 8°   | 8°  | 8°  | 4°  |
| <b>Dead Zone</b>           | None   | None  | None  | None  |
| <b>Accuracy</b>            | ≤ 0.2" (5 mm)                                | ≤ .08" (2 mm)   | ≤ .08" (2 mm)                                 | ≤ .08" (2 mm)                                 |
| <b>Voltage</b>             | 12 to 35 VDC                                 | 12 to 35 VDC, 8-30 VDC  | 12 to 35 VDC, 8-30 VDC                        | 12 to 35 VDC, 8-30 VDC                        |
| <b>Output</b>              | 2-wire 4-20 mA                               | 2-wire 4-20 mA,<br>4-wire Modbus  | 2-wire 4-20 mA,<br>4-wire Modbus              | 2-wire 4-20 mA,<br>4-wire Modbus              |
| <b>Enclosure Material</b>  | PVDF   | PVDF  | PVDF  | PVDF  |
| <b>Seal Material</b>       | FKM  | FKM   | FKM   | FKM   |
| <b>Enclosure Rating</b>    | IP66/IP68 (3 bar)                            | IP66/IP68 (3 bar)   | IP66/IP68 (3 bar)                             | IP66/IP68 (3 bar)                             |
| <b>Mounting</b>            | 1.5" Threaded NPT, 1.5"<br>Threaded Straight | 1.5" Threaded NPT, 1.5"<br>Threaded Straight  | 1.5" Threaded NPT, 1.5"<br>Threaded Straight  | 1.0" Threaded NPT, 1.0"<br>Threaded Straight  |
| <b>Connection</b>          | 32 ft. (10 m)                                | 16 ft. (5 m), 32 ft.<br>(10 m), 82 ft. (25 m)   | 16 ft. (5 m), 32 ft.<br>(10 m), 82 ft. (25 m) | 16 ft. (5 m), 32 ft.<br>(10 m), 82 ft. (25 m) |
| <b>Approvals</b>           | Ordinary locations                           | **approval  | **approval                                    | **approval                                    |
|                            |  | **approval: FM & CSA approval available for Class I, Div II;<br>Class II & III, Div I & II. ATEX Zone 1, 1/2, 2; Zone 20, 21/22 |   |   |

## OPERATING CONDITIONS

|                            |   |   |   |   |
|----------------------------|---|---|---|---|
| <b>Process Pressure</b>    | -14.5 to +43.51 psi<br>(-1 to +3 bar/-100<br>to +300 kPa) | -14.5 to +43.51 psi<br>(-1 to +3 bar/-100<br>to +300 kPa) | -14.5 to +43.51 psi<br>(-1 to +3 bar/-100<br>to +300 kPa) | -14.5 to +43.51 psi<br>(-1 to +3 bar/-100<br>to +300 kPa) |
| <b>Process Temperature</b> | -40° to +140°F<br>(-40° to +60°C)                         | -40° to +176°F<br>(-40° to +80°C)                         | -40° to +176°F<br>(-40° to +80°C)                         | -40° to +176°F<br>(-40° to +80°C)                         |
| <b>Ambient Temperature</b> | -40° to +140°F<br>(-40° to +60°C)                         | -40° to +176°F<br>(-40° to +80°C)                         | -40° to +176°F<br>(-40° to +80°C)                         | -40° to +176°F<br>(-40° to +80°C)                         |

Ask your sales representative for most recent updates

# Threaded NPT Models

## 200 Series

The 210, 220, and 230 all mount using a 1.5" threaded NPT or 1.5" threaded straight NPT connection. The enclosures are rated IP66/IP67, Type 4X to protect them from dust and water damage. They are ideal sensors for non-contact level measurement. They are suitable for use in process or storage tanks containing liquids, powders, or bulk solids, or for measuring levels in plastic tanks or IBC containers through the tank walls.

### CNCR-210

The compact 210 is a continuous level sensor with a measuring range up to 26 feet. It features a two-wire 4-20 mA output and is offered with either a 1.5-inch threaded or straight NPT connection. It can be used for measuring levels in metal or plastics storage vessels or through the tank wall when using on a plastic storage tank or an IBC container.

### CNCR-220

The 220 is much like the 210 but offers an extended measuring range up to 49 feet. It features a two-wire 4-20 mA output and is offered with either a 1.5-inch threaded or straight NPT connection. It can be used for measuring levels in metal or plastics storage vessels or through the tank wall when using on a plastic storage tank or an IBC container.



### CNCR-230

The 230 offers an LED display on the sensor housing making level readings accessible from the sensor. It can be used for measurements ranging up to 49 feet. It features a two-wire 4-20 mA output and is offered with either a 1.5-inch threaded or straight NPT connection. It can be used for measuring levels in metal or plastics storage vessels or through the tank wall when using on a plastic storage tank or IBC container.

# CNCR 200 Series Specifications

**CNCR-210**



**CNCR-220**



**CNCR-230**



## MODE OF OPERATION

|                            | CNCR-210  | CNCR-220                                       | CNCR-230                                       |
|----------------------------|---|--|--|
| <b>Measuring Principle</b> | Radar   | Radar  | Radar  |
| <b>Measuring Range</b>     | 26 ft (8 M) liquids<br>12 ft (3.7 M) solids               | 49 ft (15 M) liquids<br>24 ft (7.3 M) solids   | 49 ft (15 M) liquids<br>24 ft (7.3 M) solids   |
| <b>Frequency</b>           | 80 GHz  | 80 GHz   | 80 GHz   |
| <b>Beam Angle</b>          | 8°  | 8°   | 8°   |
| <b>Dead Zone</b>           | None  | None   | None   |
| <b>Accuracy</b>            | ≤ 0.2" (5 mm)   | ≤ .08" (2 mm)                                  | ≤ .08" (2 mm)                                  |
| <b>Voltage</b>             | 12 to 35 VDC  | 12 to 35 VDC                                   | 12 to 35 VDC                                   |
| <b>Output</b>              | 2-wire 4-20 mA  | 2-wire 4-20 mA,                                | 2-wire 4-20 mA,                                |
| <b>Enclosure Material</b>  | PVDF  | PVDF   | PVDF   |
| <b>Seal Material</b>       | FKM   | FKM  | FKM  |
| <b>Enclosure Rating</b>    | IP66/IP67, Type 4X  | IP66/IP67, Type 4X                             | IP66/IP67, Type 4X                             |
| <b>Display</b>             | None  | None   | LED Display                                    |
| <b>Mounting</b>            | 1.5" Threaded NPT,<br>1.5" Threaded Straight              | 1.5" Threaded NPT,<br>1.5" Threaded Straight   | 1.5" Threaded NPT,<br>1.5" Threaded Straight   |
| <b>Connection</b>          | One 1/2" NPT without<br>plug in either opening            | One 1/2" NPT without<br>plug in either opening | One 1/2" NPT without<br>plug in either opening |
| <b>Approvals</b>           | Ask your sales representative for the most recent updates |  |  |

## OPERATING CONDITIONS

|                            | CNCR-210   | CNCR-220   | CNCR-230   |
|----------------------------|--|--|--|
| <b>Process Pressure</b>    | -14.5 to +43.51 psi<br>(-1 to +3 bar/-100 to +300 kPa) | -14.5 to +43.51 psi<br>(-1 to +3 bar/-100 to +300 kPa) | -14.5 to +43.51 psi<br>(-1 to +3 bar/-100 to +300 kPa) |
| <b>Process Temperature</b> | -40° to +140°F<br>(-40° to +60°C)                      | -40° to +176°F<br>(-40° to +80°C)                      | -40° to +176°F<br>(-40° to +80°C)                      |





# CNCR

## Benefits

- 80 GHz technology, narrow 8° beam works reliably in challenging conditions
- Simple installation and setup, fast setup using Bluetooth on a cell phone
- No dead zone, measures right up to the face of the sensor
- Chemical resistant enclosure, IP Rated for protection against dust and water ingress
- Compact design fits in tight spaces, installs through existing openings
- Real-time measurement to BinCloud® software or integrated into a plant's PLC
- Increases safety, no climbing tanks, working over open tanks or sumps, or in confined spaces
- No maintenance, low cost of ownership

**Call or visit today for a *free* consultation and quote!**

***BINMASTER***®

Level Sensors and Software

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