Multiple Web Width Measurement — Industrial Ethernet — 1DC Series

Quick Start Guide

Controller: 1DC Series | **Output:** Industrial Ethernet

Scan for interactive guide

What You'll Achieve

After completing this guide, with per-lane width data for up to 64 lanes from the 1DC Series sensor's built-in controller available over Industrial Ethernet for your PLC.

Estimated time: ~2–3 hours

What You Need

1DC Ethernet

[ ] 1DC Series sensor (built-in controller — no separate controller needed)

[ ] 24 V DC Input Power Cable for SCU6x or 1DC - 5m (21218x-5m)

[ ] M8 to RJ45S, Shielded Cable - 5m (1407354)

[ ] 24 VDC power supply

> **Which controller variant?** 1DC is single sensor only. Each 1DC operates independently — one 1DC cannot coordinate with another for a two-sensor setup. If your lanes span wider than a single 1DC's sensing range, use an SCU6x with two ODC Family sensors.

Prerequisites

[ ] Machine accessible and safe to work on

[ ] 24 VDC power available at the installation location

[ ] Sensor mounting location identified — plan where to install one or two sensors within the machine frame for optimal coverage of all lanes

[ ] For Ethernet paths: Ethernet network ready (switch port available, IP address planned)

[ ] For Digital Monitoring path: stacklight, alarm, or PLC digital input wired and ready

[ ] Strips or lanes running (or available to run) for initial setup and teaching

[ ] For two-sensor overlap setup: a single strip of known width, wide enough to span the overlap zone between the two sensors

1. Install the Sensor

Multiple web width measurement uses free span mounting (web unsupported between rollers). Install the sensor so that the length of the sensor is parallel to the cross-machine direction (the width direction of the web). All strips and gaps must be visible within the sensor field of view.

Single Sensor Setup

- Position the sensor so all lanes and gaps are visible within the sensor field of view
- Allow margin on the outer edges for lateral wander
- Mount closer to one roller to minimize web flutter
- Ensure the web plane is parallel to the sensor length axis
- Minimum gap between strips: approximately 2 mm for the controller to distinguish individual lanes

Light source: Infrared (IR) — default for edge-based detection of multiple strips.

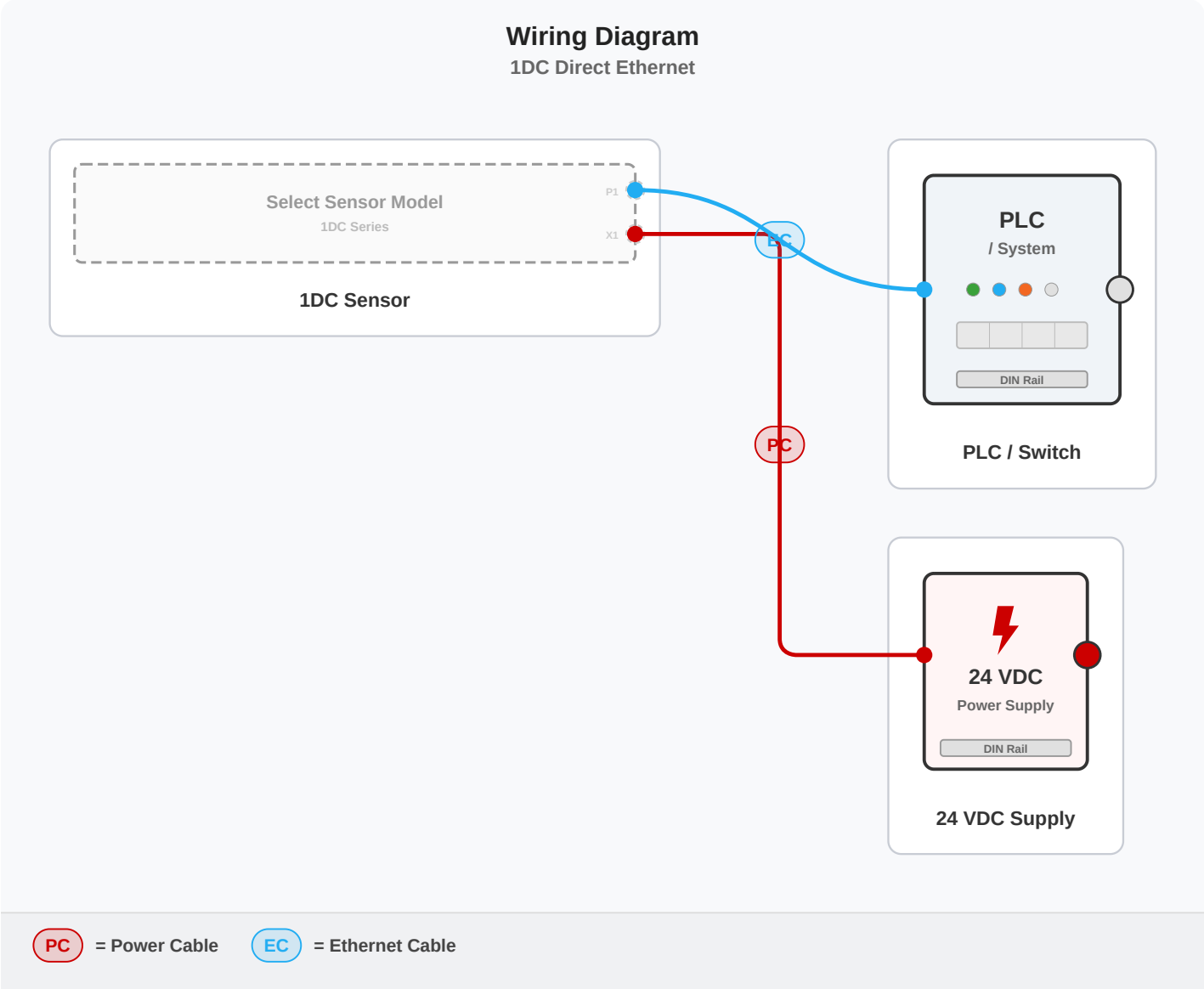
Sensor size selection: Single sensor: sensing range must cover all lanes (including gaps) plus lateral wander margin. Two sensors: each sensor covers a portion of the total lane span, and the combined coverage must span all lanes with margin.

2. Wire the System

Just power and Ethernet — no sensor cable needed.

1. Power: Connect 24 V DC Input Power Cable for SCU6x or 1DC (21218x-5m) to 1DC port X1
2. Ethernet: Connect M8 to RJ45S, Shielded Cable (1407354) from 1DC port P1 to PLC or network switch

Wiring Diagram



3. Configure & Verify

The SCU6x and 1DC share the same controller firmware with a dedicated multiple web width measurement mode that auto-detects lanes and computes per-lane widths.

Single Sensor Configuration

One sensor sees all lanes. The controller processes the sensor image, detects every edge, identifies gaps between strips, and computes the width of each lane automatically.

1. Power on — the 1DC detects all edges automatically
2. Configure via the Roll-2-Roll App (the 1DC has no touchscreen): navigate to the Width Config screen and enable multiple web mode
3. The controller auto-detects all lanes — verify lane count and per-lane widths via the App or PLC registers

Teaching Process

1. Present strips of known width in front of the sensor
2. Select the lane to teach (SCU6x: on the touchscreen or App; 1DC: via the App)
3. Enter the known width and press the Teach Correction button
4. The controller stores the correction for that lane
5. Repeat for each lane that needs correction

Teaching time: Teach correction is optional and per-lane. Can be performed once during commissioning or repeated per product for the best repeatability.

> **What success looks like:** Per-lane width and fault status appear in the Ethernet registers (same layout as SCU6x). Verify via the Roll-2-Roll App or directly from PLC registers; fault status = 0 for all lanes.

Pattern Teaching (Optional)

Locks in expected lane positions and widths. After teaching, the controller alerts on deviation — useful for slitter rewinders where blade positions are set and should remain constant during a run.

1. Ensure all lanes are running at correct widths and positions
2. Activate pattern teaching mode on the touchscreen or App
3. The controller stores the current lane positions, widths, and count as the reference pattern

> After pattern teaching, the controller alerts when: a lane shifts from its taught position, a lane width deviates from its taught value, a lane disappears, or an unexpected new lane appears.

> **What success looks like:** Pattern teaching indicator active. Controller alerts immediately if a strip is removed, added, or shifted.

Common Configuration Mistakes

- Gaps between strips too small — controller cannot distinguish adjacent lanes (see Install for the minimum gap).
- Forgetting to press Apply after changing parameters

4. PLC Integration

Per-lane width data is available in dedicated Ethernet registers (identical register layout on SCU6x and 1DC) — no PLC-side computation needed.

- Per-lane width values in application page 100–132
- Includes lane count, per-lane width, per-lane fault/status, and overall width (outermost left edge to outermost right edge)
- All width values include overlap correction (two sensors) and teach correction (if taught)
- Up to 64 lanes per controller — each lane occupies a fixed number of registers
- Rockwell customers: map multi-web registers manually using the register map. A dedicated multi-web AOI is planned for a future release.

Note: The register map, EDS file (EtherNet/IP), and Add-on Instruction (AOI) for Studio 5000 are listed under **Your Products** below — grouped on the product card.

Go Further

Related Quick Start Guides

- **Web Width Measurement (Edge-Based)** — Single web width measurement with SCU5, SCU6x, or 1DC
- **Position Measurement** — Edge, centerline, or contrast/line position measurement
- **Splice Detection** — Can run simultaneously with multi-web width measurement on the same hardware

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