

# MaNima Extensa / Recepta / Tricepta

## Highlights

- Extends digital LED data up to 100 m over shielded CAT6
- Up to 3 LED datalines per cable using the Tricepta as receiver
- No external power supply needed at the receiver — power travels over the data cable
- Recepta fits inside a LED extrusion profile: 45.6 × 21.5 mm
- Extensa and Tricepta in DIN-rail enclosures, alongside the Magnus or Pollux
- Wide input voltage on all three devices: 12–48 VDC
- Any dataline can carry an NTC signal instead of data, for remote temperature monitoring
- DIP switches on the Extensa and a rotary switch on the Recepta — no software setup
- LED power indicator for debugging

## Applications

- Projects with central technical cabinets
- LED lines with long distance breaks in between
- Remote LED lines with limited space
- Temperature measurement on LED lines further than 30 m away

## Description

The MaNima Extensa converts the digital LED data from a MaNima Magnus or Pollux into a robust differential signal that travels up to 100 m over shielded CAT6 cable. At the far end a Recepta or Tricepta converts the differential signal back into digital LED data, ready to drive the fixture.

The Tricepta handles three differential datalines at once and outputs them as three separate LED outputs — the equivalent of connecting three LED lines directly to the driver. The Recepta selects one of the three datalines with a rotary switch, in a form factor small enough to sit inside a LED extrusion profile.

Any dataline can carry an NTC signal instead of LED data. This lets a Pollux measure the temperature of a fixture at the far end of the cable, over the same cable that carries the LED data — without a separate sensor run.

The receivers draw their logic power from the data cable, so no external supply is needed at the far end. The Recepta can also work in reverse: placed at the end of a digital LED line it becomes a transmitter, generating a differential signal to bridge the gap to the next LED line, powered by the fixture itself.

## Contents

|                                          |    |
|------------------------------------------|----|
| MaNima Extensa / Recepta / Tricepta..... | 1  |
| Highlights.....                          | 1  |
| Applications.....                        | 1  |
| Description.....                         | 1  |
| Revision history.....                    | 2  |
| Electrical specifications.....           | 3  |
| Extensa.....                             | 3  |
| Recepta.....                             | 3  |
| Tricepta.....                            | 3  |
| Features.....                            | 5  |
| Differential link.....                   | 5  |
| Receivers and outputs.....               | 5  |
| Powering.....                            | 5  |
| Transmitting mode on the Recepta.....    | 5  |
| NTC temperature monitoring.....          | 5  |
| Cable lengths.....                       | 6  |
| Settings.....                            | 7  |
| Extensa.....                             | 7  |
| Recepta.....                             | 7  |
| Tricepta.....                            | 7  |
| Pinout.....                              | 8  |
| Extensa.....                             | 8  |
| Recepta.....                             | 8  |
| Tricepta.....                            | 8  |
| Mechanical specifications.....           | 12 |
| Ordering information.....                | 12 |
| Disclaimer.....                          | 12 |

## Revision history

| Revision | Change                                                                                                                                                                                | Author | Reviewer | Date        |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------|-------------|
| 1.0      | Initial release                                                                                                                                                                       | MvdH   | NOo      | August 2024 |
| 2.0      | Restructured: installation, configuration and application procedures moved to the user manual (MA243403). Datasheet reduced to specifications, pinouts, settings and mechanical data. | NOo    | MvdH     | August 2026 |

# Electrical specifications

All three devices share the same 12–48 VDC input range and the same environmental limits. Absolute maximum ratings are limits, not operating points; applying values beyond them may cause permanent damage that is not covered by warranty.

## Extensa

Table 1 — Absolute maximum ratings for Extensa

| Absolute maximum rating     | Min  | Max | Unit |
|-----------------------------|------|-----|------|
| Power supply input          | 9    | 50  | V    |
| Digital input levels        | -0.3 | 6.0 | V    |
| Differential output voltage | -15  | +15 | V    |
| Differential output current |      | 250 | mA   |
| NTC output voltage          | 0    | 3.3 | V    |
| NTC output current          |      | 30  | mA   |

Table 2 — Electrical ratings for Extensa

| Specification                                         | Min  | Max | Unit | Condition   |
|-------------------------------------------------------|------|-----|------|-------------|
| Power supply                                          | 12   | 48  | V    |             |
| Idle supply input current <sup>1</sup>                |      | 100 | mA   | 12 V        |
|                                                       |      | 66  | mA   | 24 V        |
|                                                       |      | 33  | mA   | 48 V        |
| Idle power consumption <sup>1</sup>                   |      | 1.2 | W    | 12 V        |
|                                                       |      | 1.4 | W    | 24 V        |
|                                                       |      | 1.6 | W    | 48 V        |
| Operating temperature                                 | 10   | 50  | °C   |             |
| Humidity                                              | 20   | 80  | %    |             |
| IP rating                                             | IP52 |     |      |             |
| Long line ESD protection IEC 61000-4-2                | 8/15 |     | kV   | Contact/air |
| Long line EFT protection <sup>2</sup> IEC 61000-4-4   | 2    |     | kV   |             |
| Long line surge protection <sup>3</sup> IEC 61000-4-5 | 1    |     | kV   |             |

<sup>1</sup> Idle means no outputs or inputs are driven, only power being supplied.

<sup>2</sup> EFT = Electrical Fast Transients, coming from capacitive coupling to the wiring.

<sup>3</sup> Surges can come from switching transients from nearby devices or nearby lightning strikes.

## Recepta

Table 3 — Absolute maximum ratings for Recepta

| Absolute maximum rating               | Min  | Max | Unit |
|---------------------------------------|------|-----|------|
| Power supply input (LED fixture side) | 9    | 50  | V    |
| Power supply input (cable side)       | 4.0  | 6.0 | V    |
| Digital input levels                  | -0.3 | 6.0 | V    |
| Differential input voltage            | -15  | +15 | V    |
| LED data output current               |      | ±25 | mA   |

Table 4 — Electrical ratings for Recepta

| Specification                                                | Min  | Max  | Unit | Condition   |
|--------------------------------------------------------------|------|------|------|-------------|
| <b>Power supply</b>                                          | 12   | 48   | V    |             |
| <b>Idle supply input current</b> <sup>1</sup>                |      | 50   | mA   | 12 V        |
|                                                              |      | 30   | mA   | 24 V        |
|                                                              |      | 20   | mA   | 48 V        |
| <b>Idle power consumption</b> <sup>1</sup>                   |      | 0.6  | W    | 12 V        |
|                                                              |      | 0.72 | W    | 24 V        |
|                                                              |      | 0.96 | W    | 48 V        |
| <b>Operating temperature</b>                                 | 10   | 50   | °C   |             |
| <b>Humidity</b>                                              | 20   | 80   | %    |             |
| <b>IP rating</b>                                             | IP20 |      |      |             |
| <b>Long line ESD protection IEC 61000-4-2</b>                | 8/15 |      | kV   | Contact/air |
| <b>Long line EFT protection</b> <sup>2</sup> IEC 61000-4-4   | 2    |      | kV   |             |
| <b>Long line surge protection</b> <sup>3</sup> IEC 61000-4-5 | 1    |      | kV   |             |

<sup>1</sup> Idle means no outputs or inputs are driven, only power being supplied.

## Tricepta

Table 5 — Absolute maximum ratings for Tricepta

| Absolute maximum rating                      | Min  | Max | Unit |
|----------------------------------------------|------|-----|------|
| <b>Power supply input (LED fixture side)</b> | 9    | 50  | V    |
| <b>Power supply input (cable side)</b>       | 4.0  | 6.0 | V    |
| <b>Digital input levels</b>                  | -0.3 | 6.0 | V    |
| <b>Differential input voltage</b>            | -15  | +15 | V    |
| <b>LED data output current</b>               |      | ±25 | mA   |
| <b>NTC output current</b>                    |      | ±25 | mA   |

Table 6 — Electrical ratings for Tricepta

| Specification                                                | Min  | Max | Unit | Condition   |
|--------------------------------------------------------------|------|-----|------|-------------|
| <b>Power supply</b>                                          | 12   | 48  | V    |             |
| <b>Idle supply input current</b> <sup>1</sup>                |      | 100 | mA   | 12 V        |
|                                                              |      | 66  | mA   | 24 V        |
|                                                              |      | 33  | mA   | 48 V        |
| <b>Idle power consumption</b> <sup>1</sup>                   |      | 1.2 | W    | 12 V        |
|                                                              |      | 1.4 | W    | 24 V        |
|                                                              |      | 1.6 | W    | 48 V        |
| <b>Operating temperature</b>                                 | 10   | 50  | °C   |             |
| <b>Humidity</b>                                              | 20   | 80  | %    |             |
| <b>IP rating</b>                                             | IP52 |     |      |             |
| <b>Long line ESD protection IEC 61000-4-2</b>                | 8/15 |     | kV   | Contact/air |
| <b>Long line EFT protection</b> <sup>2</sup> IEC 61000-4-4   | 2    |     | kV   |             |
| <b>Long line surge protection</b> <sup>3</sup> IEC 61000-4-5 | 1    |     | kV   |             |

<sup>1</sup> Idle means no outputs or inputs are driven, only power being supplied.

## Features

The set is built to drop into an existing Magnus or Pollux installation without software: every choice is made with a physical switch, and the receivers need no supply of their own.

### Differential link

The Extensa converts up to six digital LED data ports into differential pairs and drives them onto shielded CAT6 cable over shielded RJ45 connectors. Each cable carries three datalines plus supply and ground, and reaches up to 100 m. Because the signal is differential and the cable is shielded, the link tolerates the electrical noise of an industrial cabinet far better than a single-ended digital line, and the long-line ESD, EFT and surge protection on every device absorbs what the installation still lets through.

### Receivers and outputs

The Tricepta recovers all three datalines from one cable and presents them as three independent LED outputs on a screw terminal — electrically the same as connecting three LED lines directly to the driver. The Recepta recovers one dataline, selected with a rotary switch, and outputs it on a three-pole terminal. At 45.6 × 21.5 mm the Recepta fits inside a LED extrusion profile; it is also available as a bare PCB with solder pads instead of connectors.

### Powering

The Extensa runs from the same 12–48 VDC supply as the Magnus or Pollux it sits next to. The Recepta and Tricepta take their logic power from the data cable, so the far end of the run needs no supply of its own. Where a local supply is present anyway, the receivers can also draw from the LED fixture side and will select a suitable source automatically.

**Neither the Recepta nor the Tricepta supplies power to the LED fixtures themselves. Fixtures are always powered externally.**

### Transmitting mode on the Recepta

Set to one of its transmitting modes, a Recepta works in reverse: placed at the end of a digital LED line it takes the fixture's data and generates a differential signal, bridging the distance to the next LED line where a second Recepta receives it. In this mode the Recepta is powered by the LED fixture, so no supply is needed at either end of the gap.

### NTC temperature monitoring

One dataline per cable can carry an analog NTC signal instead of LED data, so a Pollux can read the temperature of a fixture at the far end of the run over the same cable. The Extensa selects data or NTC per port with its DIP switches. The Recepta carries a built-in NTC sensor next to one of its mounting holes — mount it against the fixture and enable it with the rotary switch. The Tricepta takes an external NTC on its own two-pole terminal; enabling it disables the Tricepta's output 2, leaving outputs 1 and 3 available.

## Cable lengths

The differential link is specified for shielded CAT6 or CAT6A cable with shielded RJ45 connectors.

Table 7 — Maximum cable lengths

| Connection                                                | Maximum length                      |
|-----------------------------------------------------------|-------------------------------------|
| <b>Extensa to a Recepta or Tricepta, over CAT6</b>        | 100 m                               |
| <b>Recepta to Recepta in transmitting mode, over CAT6</b> | 100 m                               |
| <b>Recepta or Tricepta to the LED fixture</b>             | 10 m                                |
| <b>Magnus or Pollux to an Extensa input</b>               | Keep as short as the cabinet allows |

*Beyond 10 m the recovered single-ended data is as vulnerable to interference as the line the differential link was fitted to replace.*

## Settings

All configuration is made with physical switches, reachable without opening an enclosure.

### Extensa

Six DIP switches set, per data port, whether the port carries digital LED data or an NTC signal. The settings are independent and can be mixed freely.

Table 8 — DIP switch settings on Extensa

| DIP switch | Setting when on    | Setting when off                |
|------------|--------------------|---------------------------------|
| 1          | Data port 1 is NTC | Data port 1 is digital LED data |
| 2          | Data port 2 is NTC | Data port 2 is digital LED data |
| 3          | Data port 3 is NTC | Data port 3 is digital LED data |
| 4          | Data port 4 is NTC | Data port 4 is digital LED data |
| 5          | Data port 5 is NTC | Data port 5 is digital LED data |
| 6          | Data port 6 is NTC | Data port 6 is digital LED data |

### Recepta

A rotary switch selects which of the three datalines the Recepta receives or transmits, and whether the NTC is enabled.

Table 9 — Recepta rotary switch settings

| Switch setting | Mode                            | Remark                    |
|----------------|---------------------------------|---------------------------|
| 0              | Receiving data from dataline 1  | No NTC                    |
| 1              | Receiving data from dataline 2  | No NTC                    |
| 2              | Receiving data from dataline 3  | No NTC                    |
| 3              | Transmitting data to dataline 1 | No NTC                    |
| 4              | Transmitting data to dataline 2 | No NTC                    |
| 5              | Transmitting data to dataline 3 | No NTC                    |
| 6              | Receiving data from dataline 1  | NTC enabled on dataline 2 |
| 7              | Receiving data from dataline 3  | NTC enabled on dataline 2 |
| 8 to F         | Equal to setting 0              | Reserved for future use   |

*Settings 0, 1, 2, 6 and 7 can be changed on the fly. Changing between a receiving and a transmitting mode requires a power cycle; until then the device keeps its previous setting.*

*Make sure no Extensa or other transmitting device is on the bus before switching a Recepta to a transmitting mode.*

### Tricepta

A single switch next to the RJ45 input connector selects what dataline 2 carries. In the default position — the lid away from the edge of the board — dataline 2 carries digital LED data. In the other position it carries the NTC signal, and output 2 of the Tricepta is disabled.

# Pinout

## Extensa

Table 10 — Extensa input connector 1 pinout

| Pin          | Signal            | Values         |
|--------------|-------------------|----------------|
| <b>CN1.1</b> | Ground            |                |
| <b>CN1.2</b> | Ground            |                |
| <b>CN1.3</b> | Power input       | 12–48 V        |
| <b>CN1.4</b> | Ground            |                |
| <b>CN1.5</b> | Data input port 1 | 5 V data input |
| <b>CN1.6</b> | Ground            |                |
| <b>CN1.7</b> | Data input port 2 | 5 V data input |
| <b>CN1.8</b> | Ground            |                |
| <b>CN1.9</b> | Data input port 3 | 5 V data input |

Table 11 — Extensa input connector 2 pinout

| Pin          | Signal            | Values         |
|--------------|-------------------|----------------|
| <b>CN2.1</b> | Ground            |                |
| <b>CN2.2</b> | Ground            |                |
| <b>CN2.3</b> | Power input       | 12–48 V        |
| <b>CN2.4</b> | Ground            |                |
| <b>CN2.5</b> | Data input port 4 | 5 V data input |
| <b>CN2.6</b> | Ground            |                |
| <b>CN2.7</b> | Data input port 5 | 5 V data input |
| <b>CN2.8</b> | Ground            |                |
| <b>CN2.9</b> | Data input port 6 | 5 V data input |

The outputs of the Extensa are shielded RJ45 to protect signal integrity from external influences.

The suggested counterpart is a shielded RJ45 connector for CAT6(A), matched to the cable and conductor diameter. Use the default colour wiring scheme that applies to your area (T568A or T568B), the same scheme on both ends, or use a premade patch cable.

Two numbering schemes are used, and they mean different things. Port 1 to Port 6 are the six data inputs on the Extensa input connectors. D1 to D6 are those same six signals on the differential side, printed above the RJ45 sockets; D1 comes from Port 1, D2 from Port 2, and so on. Dataline 1, 2 and 3 are positions inside one cable: every output carries three of the six D signals, one in each position, and which D sits in which position differs per output. A receiver selects a position, not a D signal. Dataline 2, the middle position, is the only one that can carry an NTC signal.

Table 12 — Extensa output connector pinout

| Output pin          | Signal              |
|---------------------|---------------------|
| <b>Output 1.1</b>   |                     |
| <b>Output 1.1.1</b> | D1 positive         |
| <b>Output 1.1.2</b> | D1 negative         |
| <b>Output 1.1.3</b> | VDD                 |
| <b>Output 1.1.4</b> | D2 positive / NTC + |
| <b>Output 1.1.5</b> | D2 negative / NTC – |
| <b>Output 1.1.6</b> | Ground              |
| <b>Output 1.1.7</b> | D3 positive         |
| <b>Output 1.1.8</b> | D3 negative         |
| <b>Output 1.2</b>   |                     |
| <b>Output 1.2.1</b> | D2 positive         |
| <b>Output 1.2.2</b> | D2 negative         |
| <b>Output 1.2.3</b> | VDD                 |
| <b>Output 1.2.4</b> | D3 positive / NTC + |
| <b>Output 1.2.5</b> | D3 negative / NTC – |
| <b>Output 1.2.6</b> | Ground              |
| <b>Output 1.2.7</b> | D4 positive         |
| <b>Output 1.2.8</b> | D4 negative         |
| <b>Output 2.1</b>   |                     |
| <b>Output 2.1.1</b> | D3 positive         |
| <b>Output 2.1.2</b> | D3 negative         |
| <b>Output 2.1.3</b> | VDD                 |
| <b>Output 2.1.4</b> | D4 positive / NTC + |
| <b>Output 2.1.5</b> | D4 negative / NTC – |
| <b>Output 2.1.6</b> | Ground              |
| <b>Output 2.1.7</b> | D5 positive         |
| <b>Output 2.1.8</b> | D5 negative         |
| <b>Output 2.2</b>   |                     |
| <b>Output 2.2.1</b> | D4 positive         |
| <b>Output 2.2.2</b> | D4 negative         |
| <b>Output 2.2.3</b> | VDD                 |
| <b>Output 2.2.4</b> | D5 positive / NTC + |
| <b>Output 2.2.5</b> | D5 negative / NTC – |
| <b>Output 2.2.6</b> | Ground              |
| <b>Output 2.2.7</b> | D6 positive         |
| <b>Output 2.2.8</b> | D6 negative         |
| <b>Output 3.1</b>   |                     |
| <b>Output 3.1.1</b> | D5 positive         |
| <b>Output 3.1.2</b> | D5 negative         |
| <b>Output 3.1.3</b> | VDD                 |
| <b>Output 3.1.4</b> | D6 positive / NTC + |
| <b>Output 3.1.5</b> | D6 negative / NTC – |
| <b>Output 3.1.6</b> | Ground              |
| <b>Output 3.1.7</b> | D1 positive         |
| <b>Output 3.1.8</b> | D1 negative         |
| <b>Output 3.2</b>   |                     |
| <b>Output 3.2.1</b> | D6 positive         |
| <b>Output 3.2.2</b> | D6 negative         |
| <b>Output 3.2.3</b> | VDD                 |
| <b>Output 3.2.4</b> | D1 positive / NTC + |
| <b>Output 3.2.5</b> | D1 negative / NTC – |
| <b>Output 3.2.6</b> | Ground              |
| <b>Output 3.2.7</b> | D2 positive         |
| <b>Output 3.2.8</b> | D2 negative         |

## Recepta

If the Recepta without connectors is used, the solder pads can be used to connect the cable.

The RJ45 side is the differential side: the input in a receiving mode, the output in a transmitting mode. The 3-pole terminal is the single-ended side and reverses with it — the output to the fixture when receiving, the input from an LED line when transmitting.

Table 13 — Recepta differential side pinout

| Pin | Signal                      | Solder pad |
|-----|-----------------------------|------------|
| 1   | Dataline 1 positive         | P1         |
| 2   | Dataline 1 negative         | P2*        |
| 3   | Extensa power V+            | P3         |
| 4   | Dataline 2 positive / NTC + | P4         |
| 5   | Dataline 2 negative / NTC – | P5         |
| 6   | Extensa power GND           | P6         |
| 7   | Dataline 3 positive         | P7*        |
| 8   | Dataline 3 negative         | P8         |

\* These pads are not labelled because of limited space on the board, but are in logical order.

Table 14 — Recepta output pinout

| Pin | Signal      | Solder pad |
|-----|-------------|------------|
| 1   | V+          | V+         |
| 2   | Data output | Data       |
| 3   | Ground      | GND        |

## Tricepta

Table 15 — Tricepta input connector J1 pinout

| Pin | Signal                      |
|-----|-----------------------------|
| 1   | Dataline 1 positive         |
| 2   | Dataline 1 negative         |
| 3   | Extensa power V+            |
| 4   | Dataline 2 positive / NTC + |
| 5   | Dataline 2 negative / NTC – |
| 6   | Extensa power GND           |
| 7   | Dataline 3 positive         |
| 8   | Dataline 3 negative         |

Table 16 — Tricepta NTC connector J3 pinout

| Pin | Signal |
|-----|--------|
| 1   | NTC +  |
| 2   | NTC -  |

Table 17 — Tricepta output connector J2 pinout

| Pin | Signal          |
|-----|-----------------|
| 1   | Output 1 V+     |
| 2   | Output 1 data   |
| 3   | Output 1 ground |
| 4   | Output 2 V+     |
| 5   | Output 2 data   |
| 6   | Output 2 ground |
| 7   | Output 3 V+     |
| 8   | Output 3 data   |
| 9   | Output 3 ground |

## Mechanical specifications

The Extensa and the Tricepta are fitted inside a DIN-rail enclosure. The Recepta is a bare PCB without enclosure.

Table 18 — Enclosure properties (Extensa and Tricepta)

| Property                    | Value                                         |
|-----------------------------|-----------------------------------------------|
| <b>Standard</b>             | Design meets the requirements of DIN 43880    |
| <b>Mounting</b>             | 35 mm DIN rail, or screwed to a flat surface  |
| <b>Material</b>             | Durable light-grey UL94-V0 flame-retardant PC |
| <b>Body length x height</b> | 90 mm x 58 mm                                 |

Table 19 — Dimensions per product

| Product         | Width             | Remark                                             |
|-----------------|-------------------|----------------------------------------------------|
| <b>Extensa</b>  | 3 units, 159.2 mm | Wall-mounting hole pitch 99.8 mm                   |
| <b>Tricepta</b> | 1 unit, 53.4 mm   | Wall-mounting hole pitch 99.8 mm, equal to Extensa |
| <b>Recepta</b>  | 45.6 x 21.5 mm    | Bare PCB, no enclosure, IP20                       |

## Ordering information

| Order number    | Type            | Remark                |
|-----------------|-----------------|-----------------------|
| <b>EXTENSA</b>  | MaNima Extensa  | In DIN-rail enclosure |
| <b>TRICEPTA</b> | MaNima Tricepta | In DIN-rail enclosure |
| <b>RECEPTA</b>  | MaNima Recepta  | With connectors       |
| <b>RECEBARE</b> | MaNima Recepta  | Without connectors    |

All products are carefully handled and packaged in ESD-safe methods.

Installation, commissioning and application procedures are described in the user manual, MA243403.

## Disclaimer

The information provided in this datasheet is “AS IS” and can change any moment without notice. MaNima Technologies BV can never be held responsible for mistakes, typo’s or other faults that lead to failures or errors in a realization. We advise to regularly check this document for updates by checking the revision on the top left corner of each page.