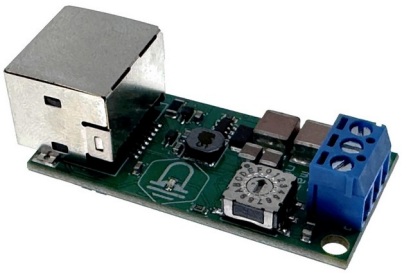
MaNima Extensa



MaNima Recepta

MaNima Tricepta

Shown at equal height, not to scale.

MaNima Extensa / Recepta / Tricepta

User Manual

Installation, commissioning, configuration and maintenance

Read this manual in full before you install these products.

Document	Detail
Document number	MA243403
Revision	1.0
Date	August 2026
Products	MaNima Extensa, MaNima Recepta, MaNima Tricepta
Datasheet	DS243403 — Extensa / Recepta / Tricepta, rev 2.0

Contents

1 Revision history

Revision	Change	Author	Reviewer	Date
1.0	New manual for the Extensa, Recepta and Tricepta.	NOo	MvdH	August 2026

2 About this manual

Thank you for using the MaNima Extensa, Recepta and Tricepta. This manual describes how to install, commission, configure and maintain them. Anyone who works with these products must have read it.

2.1 Who this manual is for

Installation and commissioning must be carried out by certified personnel: technicians familiar with low-voltage DC installation, the applicable local wiring regulations, and the installation the products are built into. Hand these instructions to the technicians and end users responsible for installing or operating the products. The manual assumes you already know the MaNima Magnus or Pollux driver these products extend.

2.2 Scope

This manual covers the MaNima Extensa, Recepta and Tricepta in all currently shipping hardware versions. These products contain no user-updatable firmware; every setting is made with a physical switch, so there is no firmware version to match against.

2.3 Conventions

Safety notices appear in three levels, explained in the Safety chapter. A notice always stands before the step it guards. Numbered lists are procedures: perform one step at a time, in order. Names printed on the hardware are written exactly as labelled, for example CN1.3 or Output 3.2.

Three products are covered in one manual. Where a section applies to only some of them, a marker appears directly under the heading:

Applies to: Extensa, Tricepta

A section with no marker applies to all three. Where the difference sits inside a single sentence or step it is written in brackets instead, for example “(Recepta only)”. Where a whole procedure differs, the heading itself names the product.

2.4 Related documents

This manual does not repeat the full specifications. For ratings, electrical characteristics and mechanical drawings, see the Extensa / Recepta / Tricepta datasheet (DS243403). Only the values you need while working at the terminal block are reproduced here.

Wiring diagrams are available from the MaNima support pages.

Downloads: https://www.manima-technologies.com/support/downloads/

3 Safety

This chapter states the notice hierarchy used throughout the manual and the general safety requirements that apply to every procedure. Hazards belonging to one specific procedure are stated at that procedure.

3.1 Notice hierarchy

Level	Meaning
WARNING	Could cause death or serious injury.
CAUTION	Could cause minor or moderate injury.
NOTICE	No personal injury; equipment damage, data loss or a voided warranty.

3.2 General requirements

> **WARNING — LIVE DC TERMINALS AND DATA CABLES**
> The supply terminals of the Extensa carry up to 48 V DC, and the RJ45 cable to a receiver carries supply voltage as well as data. Both remain live for as long as the Extensa is connected.
> **Isolate the supply and verify zero voltage at the terminals before you work on any connection, including an RJ45 link.**

- Read this manual in full before you install these products.
- Installation and service may only be carried out by certified personnel.
- Do not open, modify or repair the products. Any modification or repair by anyone other than MaNima Technologies BV voids the warranty and the protection built into the product.
- Do not put a product into service if it is damaged, shows visible damage, does not operate correctly, or behaves in any way that is out of the ordinary for an electrical device.
- Wire the products only as described in this manual.
- Verify that the power source is free of short circuits before you connect it.
- Keep the supply input within 12–48 V DC. The absolute maximum is 50 V. Higher voltages may damage the product.
- Never place a Recepta in a transmitting mode on a bus that an Extensa also drives. Two transmitters on one differential pair can damage both line drivers.
- The Extensa and Tricepta are rated IP52 and must be protected against moisture. The Recepta is a bare PCB rated IP20: protected against fingers, not against moisture, so it must be housed by the fixture or profile it is mounted in.
- Never apply the 12–48 V supply to the RJ45 side of a Recepta or Tricepta. The cable side runs on 4–6 V and is damaged by anything higher.
- Operate the products between 10 °C and 50 °C, at 20–80 % relative humidity.
- The LED fixtures are never powered by a Recepta or Tricepta. Give every fixture its own supply.
- To de-energise a receiver, disconnect the Extensa supply and any local fixture supply. There is no on/off switch.

4 Product overview

The MaNima Extensa, Recepta and Tricepta extend the digital LED data of a MaNima Magnus or Pollux over long distances. This chapter explains what each product does and how the three differ; everywhere else in this manual each product is described on its own terms.

4.1 How the link works

A Magnus or Pollux drives digital LED fixtures over single-ended data lines. Those lines are short-range and sensitive to the electrical noise of an industrial cabinet. The Extensa converts up to six of them into differential signals and drives them onto shielded CAT6 cable over shielded RJ45 connectors, reaching up to 100 m. Each cable carries three datalines plus supply and ground.

At the far end a Recepta or Tricepta converts the differential signal back into digital LED data. Because the signal is differential and the cable is shielded, noise that reaches both conductors equally cancels out, and the long-line ESD, EFT and surge protection on every device absorbs what the installation still lets through.

4.2 How the datalines are named

Two numbering schemes appear throughout this manual and on the products themselves, and they mean different things. Keeping them apart is what makes the wiring unambiguous.

- Port 1 to Port 6, printed on the Extensa input connectors, are the six data inputs from the Magnus or Pollux.
- D1 to D6, printed above the Extensa RJ45 sockets, are those same six signals once they are on the differential side. D1 comes from Port 1, D2 from Port 2, and so on.
- Dataline 1, 2 and 3 are positions inside one cable. Every RJ45 output carries three of the six D signals, and each takes one of these three positions. Which D sits in which position differs per output.
- A receiver selects a position, not a D signal. Rotary switch 0 on a Recepta means dataline 1 of whatever cable it is plugged into — which D signal that is depends on the Extensa output the cable came from.

Dataline 2, the middle position, is the only one that can carry an NTC signal. That is why enabling the NTC on a Tricepta disables its output 2.

4.3 Differences between the three products

	Extensa	Recepta	Tricepta
Role	Transmitter	Receiver, or transmitter	Receiver
Datalines handled	6 in, over 6 RJ45 outputs	1 of 3 per cable	3 per cable, simultaneously
Selection method	6 DIP switches (data or NTC per port)	Rotary switch	Single slide switch
LED outputs	—	1 (3-pole terminal)	3 (9-pole terminal)
NTC support	Routes NTC onto a dataline	Built-in sensor on the PCB	External NTC on 2-pole terminal
Own power	12–48 VDC supply	4–6 V from the cable, or the fixture	From the data cable or the fixture
Form factor	3-unit DIN-rail	Bare PCB, 45.6 × 21.5 mm	1-unit DIN-rail

Choose the Recepta where space is tight — it fits inside a LED extrusion profile — and one dataline per location is enough. Choose the Tricepta where three fixtures sit together and you want them fed from a single cable, or where an external NTC has to be connected.

4.4 Key features

- Extends digital LED data up to 100 m over shielded CAT6.
- Up to three LED datalines per cable, using the Tricepta as receiver.
- No external power supply needed at the receiver: power travels over the data cable.
- The Recepta fits inside a LED extrusion profile at 45.6 × 21.5 mm.
- The Extensa and Tricepta sit on DIN rail 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.
- The Recepta also works as a transmitter, to bridge a gap between two LED lines without an Extensa.
- LED power indicator on each device for debugging.

4.5 Protection

Protection is on the line side, where the installation is exposed:

- Long-line ESD protection to IEC 61000-4-2, 8 kV contact and 15 kV air.
- Long-line EFT protection to IEC 61000-4-4, 2 kV.
- Long-line surge protection to IEC 61000-4-5, 1 kV.
- Shielded RJ45 connectors on every differential port.

4.6 Connector overview

The Extensa has two 9-pole screw-terminal input connectors and six DIP switches on its top face, and six shielded RJ45 outputs on its bottom face. The Tricepta has one RJ45 input, a 9-pole output terminal, a 2-pole NTC terminal and a slide switch. The Recepta has one RJ45 input, a 3-pole output terminal, a rotary switch and a built-in NTC sensor next to a mounting hole. The full signal list for each connector is in the Technical reference chapter.

Figure 1 — Extensa, top face: the two 9-pole input connectors and the NTC/Data DIP switches.

Figure 2 — Extensa, bottom face: the six RJ45 outputs. Each is labelled with the three datalines it carries and the one of those three that can carry an NTC signal.

Read the label above each RJ45 socket. It states in full which datalines that output carries — for example D1/D2/D3 on Output 1.1 — and which single dataline of the three is the one that can carry an NTC signal. The same information is in the Extensa output connectors section of the Technical reference chapter.

Figure 3 — Tricepta: the RJ45 input, the NTC terminal and the NTC/Data slide switch.

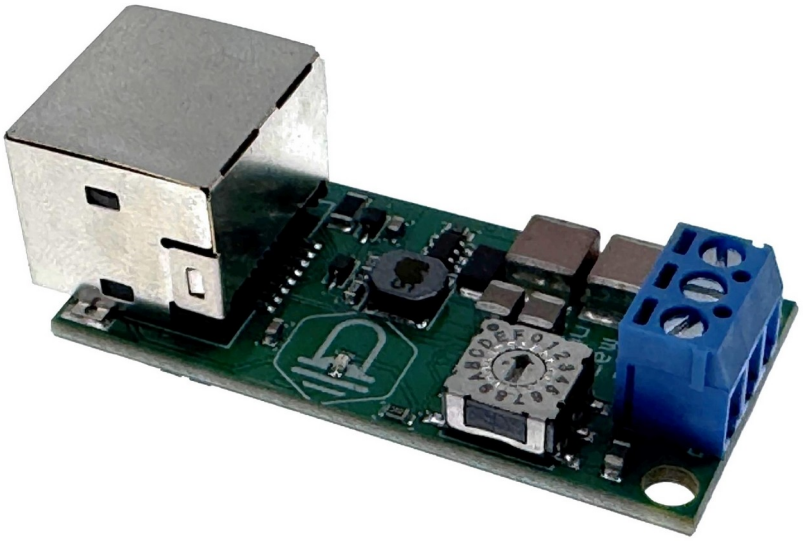


Figure 4 — Recepta: the RJ45 input, the rotary switch and the 3-pole output terminal.

5 Unpacking and scope of delivery

This chapter covers what arrives and what to check before you mount anything.

All products are handled and packaged using ESD-safe methods. Keep the products in their packaging until you are ready to mount them.

> **NOTICE — THE RECEPTA IS AN UNPROTECTED BARE PCB**
> The Recepta has exposed conductors and an unprotected connector shell. Static discharge from an ungrounded hand can damage it without any visible sign.
> **Handle it by the edges, on an ESD-safe surface, and keep it in its ESD packaging until you mount it.**

5.1 Scope of delivery

Order number	Contents
EXTENSA	One Extensa in a 3-unit DIN-rail enclosure, with mating screw-terminal connectors for both input connectors
TRICEPTA	One Tricepta in a 1-unit DIN-rail enclosure, with mating screw-terminal connectors for the output and NTC terminals
RECEPTA	One Recepta PCB with the RJ45 connector and output terminal fitted
RECEBARE	One Recepta PCB without connectors, for soldering the cable directly to the solder pads. The usual choice where space is tightest, and for a transmitting Recepta in a line-to-line bridge

Cabling, RJ45 connectors, UTP splitters, power supplies, junction boxes and external NTC sensors are not included and are ordered separately — see the Ordering information section of the product datasheet.

5.2 Checks on arrival

Inspect the products before you mount them. Damage found now is a delivery matter; damage found after installation is not.

- Check the enclosure of the Extensa or Tricepta for cracks and a distorted DIN-rail clip.
- Check that the RJ45 shells and the screw terminals are straight and undamaged.
- Check the Recepta PCB for bent pads, solder splashes or a damaged connector shell.
- Confirm the order number matches what you ordered — RECEPTA and RECEBARE look alike until you look for the connectors.

If anything is damaged or missing, contact MaNima before you power the installation.

6 Mechanical installation

This chapter mounts the units. Everything must be unpowered and unwired throughout.

6.1 Enclosure

Property	Value
Standard	Meets the requirements of DIN 43880
Mounting	35 mm DIN rail, or screwed to a flat surface
Material	Light grey UL94-V0 flame-retardant PC
Body length × height	90 mm × 58 mm
Width, Extensa	159.2 mm (3 units)
Width, Tricepta	53.4 mm (1 unit)
Wall-mounting hole pitch	99.8 mm, the same on both
IP rating	IP52

The Recepta is a bare PCB, 45.6 × 21.5 mm, with no enclosure. It is rated IP20 and relies on the fixture or profile around it for any protection against moisture or dust.

6.2 Mounting the Extensa and Tricepta

Applies to: Extensa, Tricepta

1. Hook the top of the enclosure over the upper edge of the 35 mm DIN rail.

2. Push the bottom of the enclosure towards the rail until the clip snaps home.

3. Pull gently on the enclosure to confirm it is locked. A unit that lifts off the rail is not seated; re-fit it rather than relying on the cable to hold it.

4. Mount the Extensa within reach of the Magnus or Pollux it serves. Its input wiring is short, unshielded, single-ended data and should not cross the cabinet.

5. Where a rail is not available, screw the enclosure to a flat surface. The hole pitch is 99.8 mm on both products, so one drilling pattern serves either.

Result: the DIN-rail units are mounted. Mount the enclosures with the terminals horizontal, in the normal DIN-rail attitude, so the ventilation openings sit in a rising airflow.

6.3 Mounting the Recepta

Applies to: Recepta

The Recepta is small enough to sit inside a LED extrusion profile. It has no enclosure and no ingress protection, so the profile or fixture has to provide both.

> **CAUTION — SHARP BOARD EDGES**
> The Recepta has unprotected board edges and a metal connector shell. Sliding it into a tight profile can cut the fingertips or crack the board.
> **Handle it by the long edges and slide it in without forcing.**

1. Choose a position where the RJ45 connector can still be reached for servicing and the output terminal reaches the fixture.

2. Where the built-in NTC will be used, mount the board so the sensor — next to one of the mounting holes — sits against the surface whose temperature you

want to measure. Measuring air instead of metal gives a reading that lags the fixture.

3. Secure the board through its mounting holes, and do not let it rest on the fixture's conductive surfaces.

Result: the Recepta is mounted and its sensor is in thermal contact with the fixture.

6.4 Clearances and thermal requirements

None of these products needs forced cooling, but all of them need free air around the enclosure and an ambient temperature within the limits in the Safety chapter.

- Leave at least 10 mm of free space above and below a DIN-rail enclosure.
- Do not mount a unit directly above a heat source such as an LED power supply.
- Do not press cable bundles against the face of an enclosure.
- A Tricepta in a junction box shares that box with the fixture supply. Size the box for the supply's heat, not for the Tricepta's.

7 Electrical installation

This chapter connects the supply and the differential links. All units must be mounted and the installation isolated before you start.

WARNING — MAINS VOLTAGE IN THE CABINET

The LED power supplies and the driver supply are fed from mains voltage. Contact with the mains side of a supply causes electric shock and can be fatal.

Isolate the cabinet feed and verify it is dead before working inside the cabinet. Only the low-voltage side of the installation is covered by this manual.

7.1 Cable requirements

The link between the Extensa and its receivers is shielded CAT6 or CAT6A cable with shielded RJ45 connectors, matched to the cable and conductor diameter. Use the default colour scheme that applies in your area — T568A or T568B — with the same scheme at both ends, or use a premade shielded patch cable.

NOTICE — UNSHIELDED CABLE CAUSES FAULTS THAT LOOK LIKE FIXTURE FAULTS

Unshielded cable, or a shield terminated at one end only, leaves the differential pairs exposed to cabinet noise. The result is intermittent data corruption that presents as a flickering fixture rather than a cable fault, and is hard to trace later.

Use shielded cable and shielded connectors throughout, and terminate the shield at both ends.

7.2 Cable lengths

Connection	Maximum length
Extensa to receiver, over CAT6	100 m
Recepta to Recepta, over CAT6	100 m
Receiver to LED fixture	10 m
Magnus or Pollux to Extensa input	Keep as short as the cabinet allows

7.3 Port descriptions

The connectors, per product:

- CN1 and CN2 on the Extensa — 9-pole screw terminals carrying the power input, three data inputs each, and a ground pin beside every data pin.
- Outputs 1.1 to 3.2 on the Extensa — six shielded RJ45 sockets, each carrying three datalines plus VDD and ground.
- J1 on the Tricepta — the RJ45 input from the Extensa.
- J2 on the Tricepta — the 9-pole LED fixture output, three groups of V+, data and ground.
- J3 on the Tricepta — the 2-pole terminal for an external NTC.
- The RJ45 input and 3-pole output on the Recepta, or the equivalent solder pads on the RECEBARE version.

7.4 Connecting the supply to the Extensa

Applies to: Extensa

The Extensa can share the supply of the Magnus or Pollux it sits next to. Both input connectors carry a power input pin; connecting one is enough.

> **NOTICE — REVERSE POLARITY DAMAGES THE EXTENSA**
> Reversing V+ and ground, or applying more than the rated supply voltage, causes permanent damage that is not covered by warranty.
> **Check the supply polarity and voltage against the pinout in the Technical reference chapter before applying power.**

1. Confirm the supply is isolated and secured against switch-on.
2. Connect ground to pin CN1.1 or CN1.2.
3. Connect the positive supply, 12–48 V DC, to pin CN1.3.
4. Tighten the terminal screws firmly without deforming the conductor, and give a light pull on each conductor to confirm it is held by the clamp and not by its insulation.

Result: the Extensa is wired for power. Do not switch on yet.

7.5 Powering the receivers

Applies to: Recepta, Tricepta

Neither receiver needs a supply of its own. Logic power travels over the RJ45 cable from the Extensa. Where a local supply is present anyway — typically the LED fixture's own supply — the receiver can also draw from the fixture side and will select a suitable source automatically.

A transmitting Recepta has no Extensa in front of it, so it takes its logic power the other way round: from the LED fixture it reads, over V+ and Ground on its 3-pole terminal. It then feeds the receiving Recepta at the far end over the RJ45 cable, the same way an Extensa would.

> **NOTICE — THE RJ45 SIDE RUNS ON 4–6 V, NOT ON THE SUPPLY VOLTAGE**
> The cable side of a Recepta or Tricepta is a 4–6 V rail fed by the Extensa. Feeding it the 12–48 V supply, or wiring a fixture supply onto those pins, destroys the receiver.
> **Wire the RJ45 side only to an Extensa output or to a transmitting Recepta, and connect any local supply to the 3-pole terminal instead.**

> **NOTICE — THE RECEIVERS DO NOT POWER THE LED FIXTURES**
> A fixture wired only to a receiver output stays dark, which reads as a wiring fault during commissioning.
> **Give every LED fixture its own power supply, and use the receiver output for data and reference only.**

7.6 Connecting the LED fixtures

Applies to: Recepta, Tricepta

Keep the run between a receiver and its fixture to 10 m or less. Beyond that, the recovered single-ended data becomes as vulnerable as the link the Extensa was fitted to replace.

1. Confirm the Extensa supply and the fixture supply are both isolated.

2. On a Recepta, connect V+, Data output and Ground to the fixture.

3. On a Tricepta, connect each fixture to one output group — V+, data and ground belonging to the same output number. The pin order is in the Technical reference chapter.

4. Connect the fixture's own supply to the fixture, not through the receiver.

5. Record which fixture is on which output. You need this at commissioning and again whenever anything changes.

Result: every fixture is wired to a receiver output and to its own supply.

7.7 Shielding and grounding

Shielding here is a signal-integrity measure, not a safety measure. The differential link is what it protects.

The shield is the metal shell of the RJ45 connector, and it is bonded to GND at both ends. That differs from NTC wiring on a Pollux, where the shield is connected at one end only, and the reason is worth knowing: on that Pollux run the shield would be the only path tying the two ends together, so bonding both would create a ground loop. Here GND already runs in the cable on pin 6, so both ends share a reference whatever you do with the shield. Bonding it at both ends adds no loop and gives the screen a return path at each end.

- Terminate the cable shield at both ends, through the shielded RJ45 connector shell.
- Keep CAT6 runs away from LED supply cables where they run in parallel over a distance, and cross them at right angles where they must meet.
- Do not use the data cable's ground as a return path for fixture current. The fixture supply has its own return.

8 I/O and signal connections

This chapter connects the data ports and, where used, the NTC signals. The supply wiring is complete and the installation is still isolated.

8.1 Data inputs on the Extensa

Applies to: Extensa

The Extensa takes up to six digital data ports from the Magnus or Pollux, three on each input connector. Each data pin has its own adjacent ground pin; use it rather than a shared ground bar.

1. Confirm the supply is isolated.
2. Connect each Magnus or Pollux data port to its data input pin — CN1.5, CN1.7 and CN1.9 for ports 1 to 3, CN2.5, CN2.7 and CN2.9 for ports 4 to 6.
3. Connect the ground of each data port to the ground pin beside it.
4. Keep these runs short and away from the LED supply wiring.

Result: the Extensa receives the driver's data. Which D signals then appear on which RJ45 output is fixed by the hardware — see the next section before choosing an output.

8.2 Choosing an output connector

Applies to: Extensa

The six inputs are distributed across the six RJ45 outputs so that each output carries three of the six D signals. The mapping is fixed and is not one-to-one: output 1.1 carries D1, D2 and D3, while output 2.2 carries D4, D5 and D6. Choosing outputs deliberately is what makes a six-fixture installation possible over two cables.

> **NOTICE — WORK THE MAPPING OUT FROM THE TABLE, NOT FROM MEMORY**
> The input-to-output mapping is fixed and not one-to-one. An output chosen from memory puts a D signal, or an NTC signal, in a dataline position the receiver is not reading.
> **Read the Extensa output connector pinout in the Technical reference chapter every time you assign an output.**

8.3 NTC temperature monitoring

Any one dataline per cable can carry an analog NTC signal instead of LED data, so a Pollux can read the temperature of a remote fixture over the cable that already carries its data. The Recepta has a built-in sensor on the board; the Tricepta takes an external NTC on its 2-pole terminal.

8.3.1 Wiring an NTC channel

1. Confirm the supply is isolated.
2. Connect the NTC port of the Pollux to the Extensa input port you intend to use as the NTC channel.

3. Set the matching DIP switch on the Extensa to ON. Switch 1 corresponds to Port 1, and so on.

4. From the Extensa output connector pinout, find the output that carries that port's D signal in dataline position 2 — the middle position is the only NTC-capable one — and run the cable from that output.

5. At the far end, enable the NTC on the receiver: rotary switch setting 6 or 7 on a Recepta, or the slide switch on a Tricepta.

6. On a Tricepta, connect the external NTC to the 2-pole terminal J3. On a Recepta, nothing is connected — the sensor is on the board.

Result: the driver reads the remote temperature over the data cable. On a Tricepta, output 2 is now disabled; only outputs 1 and 3 remain available.

> **NOTICE — ENABLING THE NTC ON A TRICEPTA DISABLES OUTPUT 2**
> A fixture wired to output 2 goes dark, which reads as a wiring fault during commissioning.
> **Plan the NTC channel before wiring the fixtures, and use outputs 1 and 3 on any Tricepta that carries an NTC.**

9 Commissioning

This chapter powers the installation for the first time and verifies it. All wiring must be complete and every switch set before you start.

9.1 Before you switch on

1. Verify that every unit is mounted and locked to its rail, surface or profile.
2. Verify the supply polarity at the Extensa against the pinout.
3. Verify that every RJ45 link is fully inserted and latched at both ends.
4. Verify that every LED fixture has its own power supply connected.
5. Verify that the DIP switches on the Extensa match the intended data and NTC assignment.
6. Verify that every receiver's switch setting matches the dataline it is meant to handle.
7. Verify that no Recepta is set to a transmitting mode on a bus an Extensa drives.

> **NOTICE — TWO TRANSMITTERS ON ONE BUS**
> An Extensa and a Recepta in transmitting mode drive the same differential pair against each other. This is a bus conflict that can damage both devices' line drivers.
> **Confirm every Recepta's rotary switch setting before you apply power.**

9.2 First power-up

1. Switch on the LED fixture supplies.
2. Switch on the driver and Extensa supply.
3. Check the LED power indicator on each unit. An indicator that stays dark means the unit has no logic power — stop and find out why before continuing.
4. Send a known pattern from the Magnus or Pollux, one dataline at a time. Driving all channels at once hides a swapped dataline.
5. Confirm each fixture responds on the dataline you expect.
6. Where an NTC is used, confirm the driver reads a plausible temperature.
7. Run the installation at full output long enough to reach steady temperature, and confirm nothing drifts or drops out.

Result: the installation is powered and verified under load. Record the dataline-to-fixture map, the NTC channel and every switch position before you hand it over — they are what the next person needs in order to change anything safely.

9.3 Indications

Each product carries a LED power indicator. It reports one thing: whether the unit has logic power.

Indicator	State	Meaning
LED power indicator	Lit	The unit has logic power.
	Dark	No logic power. On an Extensa, check the supply. On a receiver, check the RJ45 link that feeds it, then the Extensa.

10 Configuration and operation

This chapter sets the switches that determine what each unit does, and works through the standard installation patterns.

These products hold no software configuration. Everything is set with physical switches, so a unit can be replaced in the field by matching the switch positions of the one it replaces.

10.1 Extensa DIP switches

Applies to: Extensa

Six DIP switches, reachable without opening the enclosure, set per data port whether that port carries digital LED data or an NTC signal. Switch 1 corresponds to data port 1 and so on. With a switch off, the port carries LED data. The settings are independent and can be mixed freely. The full table is in the Technical reference chapter.

10.2 Recepta rotary switch

Applies to: Recepta

A rotary switch selects which of the three datalines on the cable the Recepta handles, whether it receives or transmits, and whether the NTC is enabled. Settings 0, 1, 2, 6 and 7 can be changed on the fly. The full table is in the Technical reference chapter.

Receiving and transmitting reverse the whole board. In a receiving mode the RJ45 is the input and the 3-pole terminal drives the fixture. In a transmitting mode the 3-pole terminal becomes the input, taking single-ended data from an LED line, and the RJ45 becomes the differential output. This is what lets two Receptas bridge a gap between two LED lines without an Extensa — one transmitting, one receiving.

> **NOTICE — A CHANGE OF DIRECTION NEEDS A POWER CYCLE**
> Changing between a receiving and a transmitting mode does not take effect immediately. Until the Recepta is power-cycled it keeps its previous setting, so the installation appears to ignore a change that was made correctly.
> **Power-cycle the Recepta after changing between receiving and transmitting modes.**

10.3 Tricepta switch

Applies to: Tricepta

One slide switch next to the RJ45 input connector decides what dataline 2 carries. In the default position — the lid away from the edge of the board — dataline 2 carries LED data and all three outputs are available. In the other position dataline 2 carries the NTC signal and output 2 is disabled.

10.4 Worked configurations

Three patterns cover most installations. Each shows the switch settings and the port choices that make it work.

10.4.1 Three remote fixtures with Recepta receivers

Three fixtures, each in a tight profile, fed from one cable branched with UTP splitters. Three data ports of the Magnus are used.

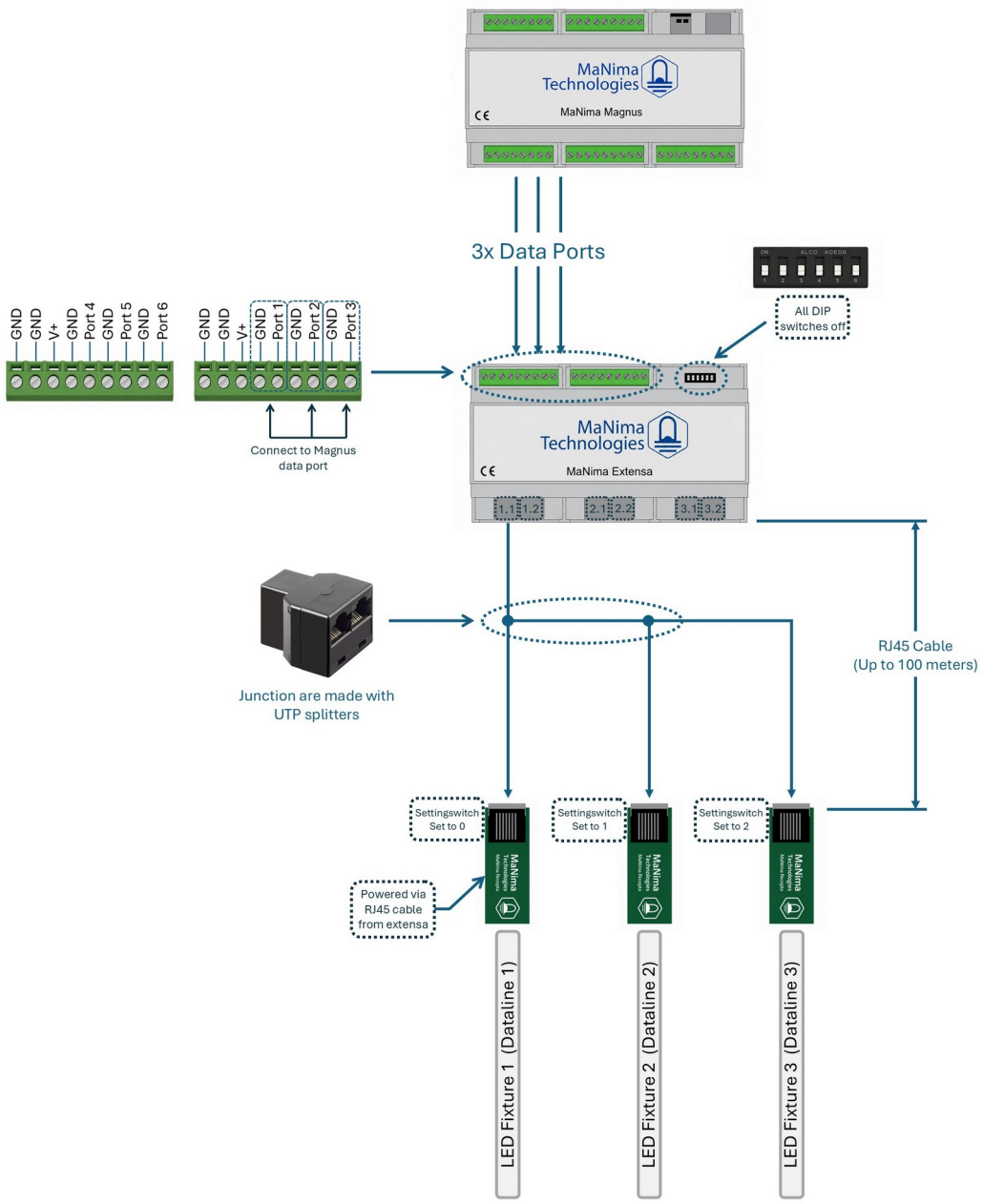


Figure 5 — Three remote LED fixtures with Extensa and Recepta receivers.

- All Extensa DIP switches off: no NTC is used, so every port carries LED data.
- The cable is branched with UTP splitters; each branch reaches one Recepta.
- Output 1.1 is used, so the cable carries D1, D2 and D3 in dataline positions 1, 2 and 3 respectively.
- Rotary switch 0 on the first Recepta — dataline 1, which is D1, from Magnus port 1.
- Rotary switch 1 on the second — dataline 2, which is D2, from Magnus port 2.

- Rotary switch 2 on the third — dataline 3, which is D3, from Magnus port 3.
- The Receptas are powered over the RJ45 cable; the fixtures are powered separately.

10.4.2 Six remote fixtures with a remote junction box

Six fixtures driven over only two cables, by putting a Tricepta and a local supply in a junction box at each location. All six Magnus ports are used.

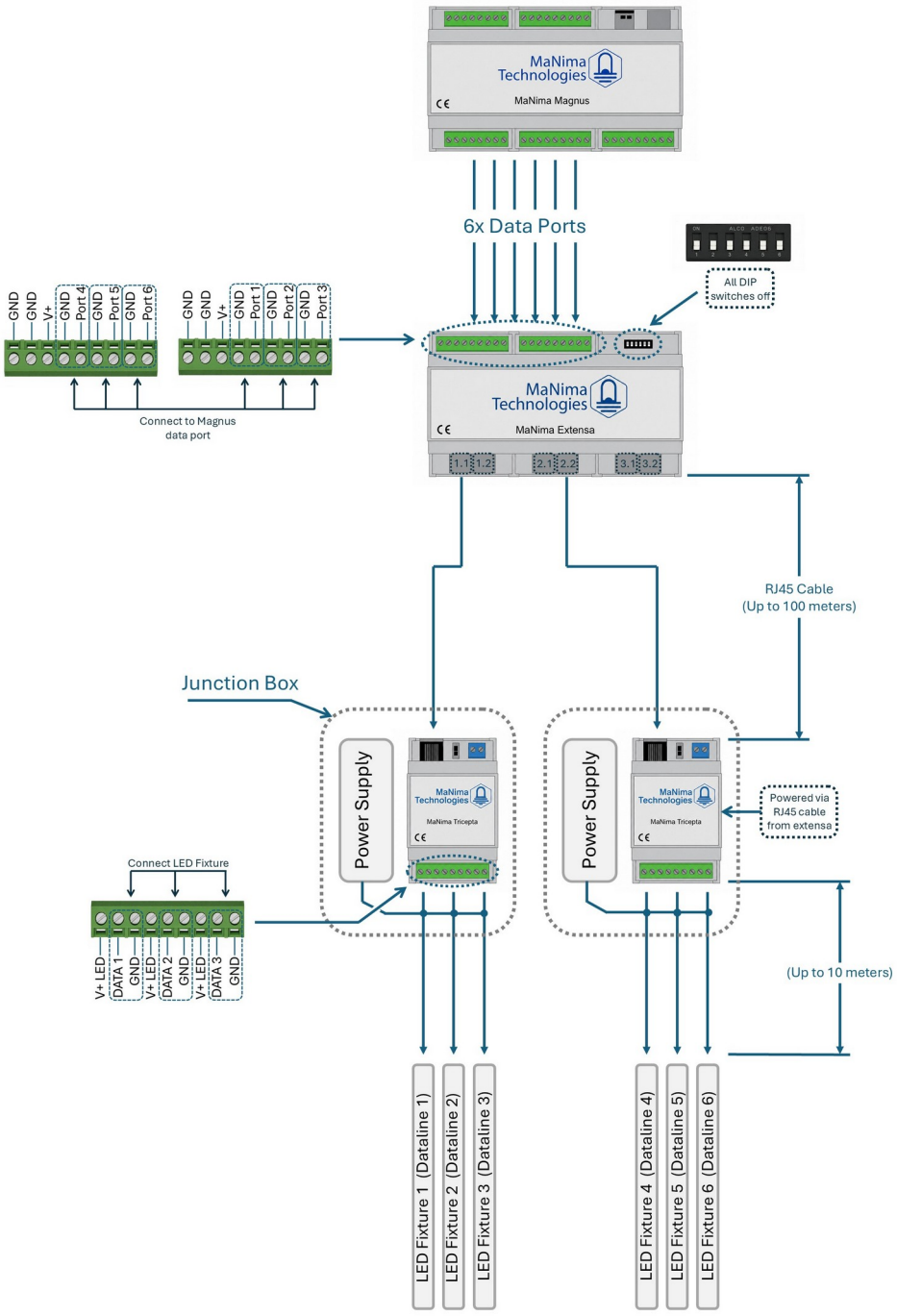


Figure 6 — Six remote LED fixtures with remote junction boxes.

- All six Magnus data ports are connected to the Extensa.

- Outputs 1.1 and 2.2 feed the two Triceptas. This pair is chosen deliberately: output 1.1 carries D1, D2 and D3, and output 2.2 carries D4, D5 and D6, so all six are distributed over two cables with none repeated.
- All Extensa DIP switches off: no NTC is used.
- Both Tricepta switches in the default position, so all three outputs are live.
- Each junction box holds its own power supply for the fixtures.

10.4.3 Two remote fixtures with temperature measurement

A Pollux measures the temperature of a remote fixture over the same cable that carries its data. Two Magnus data ports and one Pollux NTC line are used.

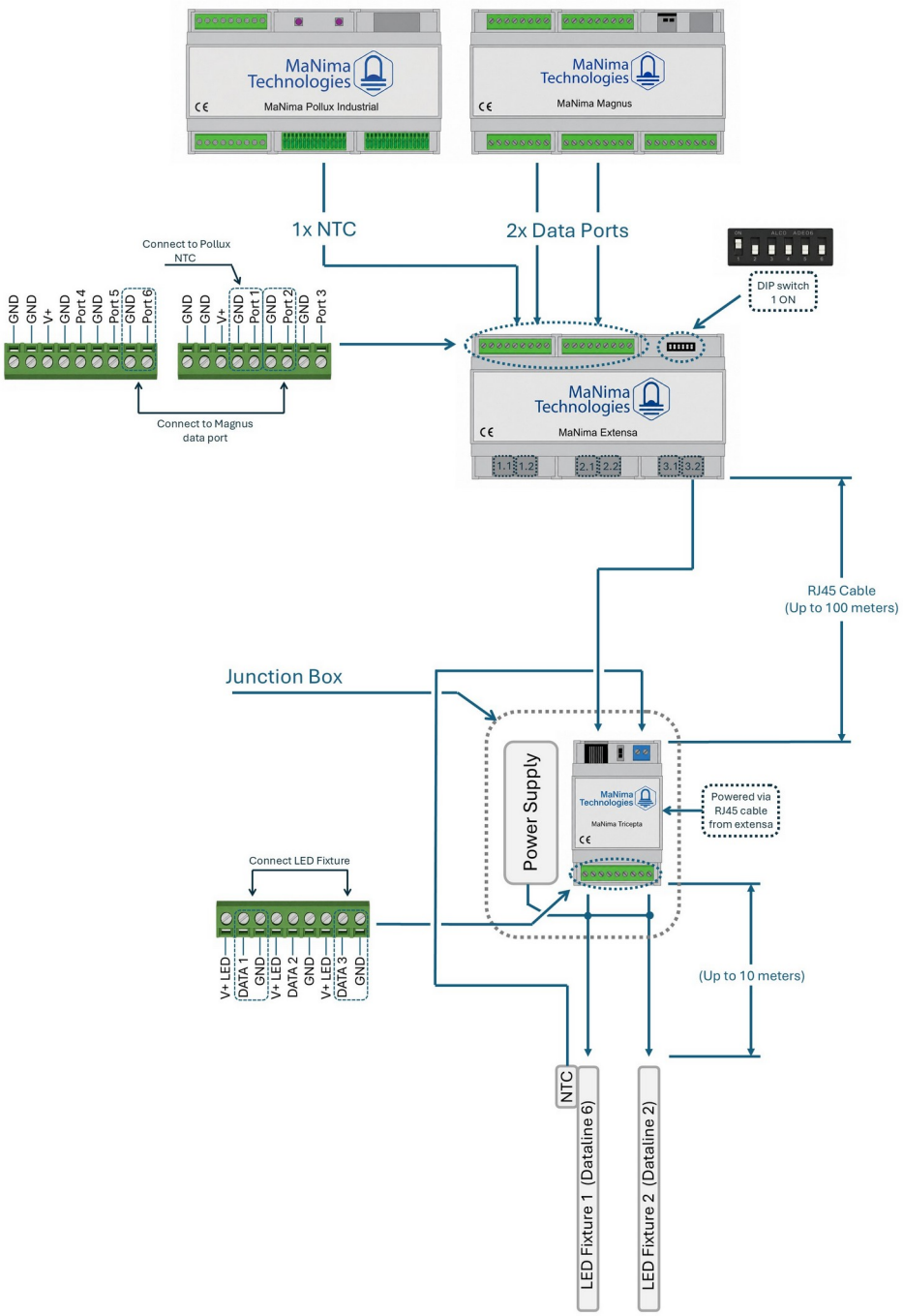


Figure 7 — Two remote LED fixtures with NTC temperature measurement.

- The Pollux NTC port is connected to Extensa input port 1; Magnus data ports feed inputs 2 and 6.
- Extensa DIP switch 1 is ON, so input port 1 carries the NTC signal instead of data.
- Output 3.2 is used. Per the output connector pinout it carries D6 in dataline position 1, D1 in position 2, and D2 in position 3. Position 2 is the NTC-capable one, which is why the NTC has to be on Port 1.
- At the Tricepta, dataline 1 appears on output 1 and dataline 3 on output 3 — so D6 drives the first fixture and D2 the second.
- The Tricepta NTC switch is on, which disables output 2. Outputs 1 and 3 carry the two fixtures.

10.4.4 Extending an LED strip with two Receptas

Two LED lines that sit too far apart to be wired directly, bridged by a pair of Receptas and one CAT6 cable. No Extensa and no driver channel is involved: the first Recepta reads the data that the first LED line already carries and puts it back on the line at the far end. The link itself is the same 100 m differential link the Extensa uses.

Take the direction of the data as left to right. The left LED fixture feeds its data into the left Recepta, which transmits; the right Recepta receives and drives the right LED fixture.

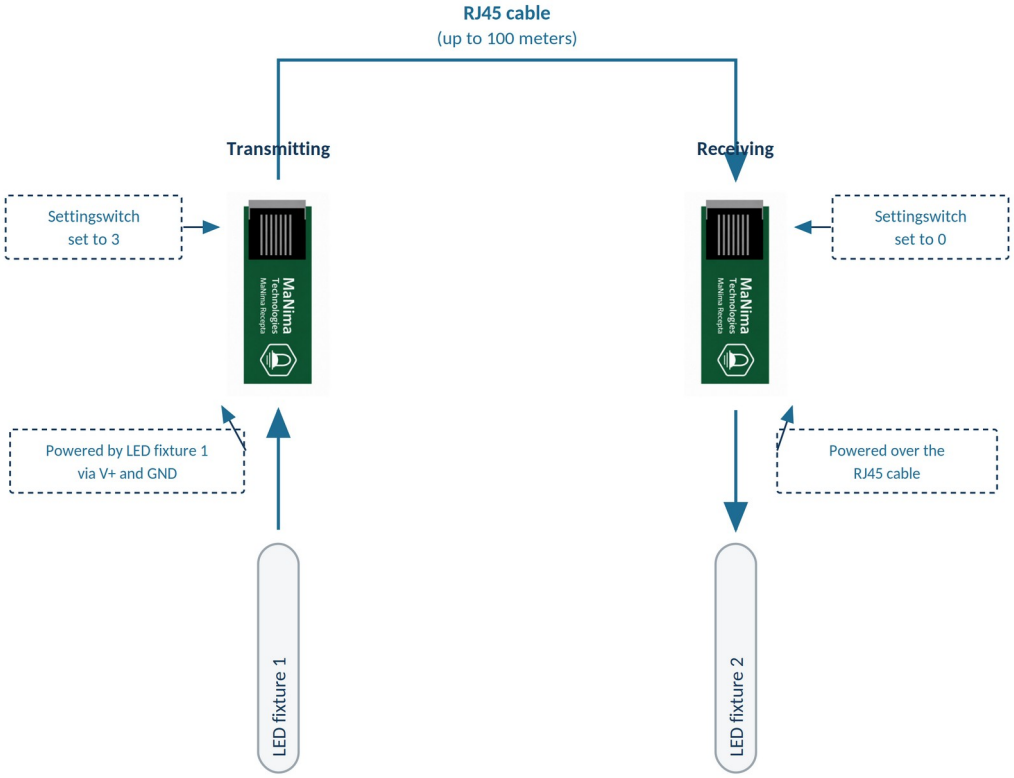


Figure 8 — Extending an LED strip: a transmitting Recepta on the first line, a receiving one on the second, joined by a single CAT6 cable.

- The left Recepta is set to rotary switch 3 — transmitting on dataline 1. Power-cycle it after setting the switch; a change of direction does not take effect until you do.
- The right Recepta stays on rotary switch 0 — receiving dataline 1.
- The left Recepta is powered by the LED fixture it reads: connect V+ and Ground of that fixture to its 3-pole terminal alongside the data conductor.
- The right Recepta is powered over the CAT6 cable. Its own LED power supply may be connected to its V+ and Ground as well; it selects a suitable source automatically.
- The RECEBARE version, without connectors, is the usual choice here — both cables solder straight onto the pads, which fits where a connector would not.

> **NOTICE — NEVER BRIDGE ONTO A BUS AN EXTENSA ALSO DRIVES**
> A transmitting Recepta and an Extensa drive the same differential pair against each other. This is a bus conflict that can damage the line drivers of both.
> **Use a Recepta pair only on a cable of its own, between two LED lines, with no Extensa on it.**

1. Confirm both LED fixture supplies are isolated.

2. Set the left Recepta to rotary switch 3 and the right one to 0.

3. On the left Recepta, connect the data conductor of the first LED line to the Data pin of the 3-pole terminal, and that line's V+ and Ground to the V+ and Ground pins.

4. On the right Recepta, connect the Data, V+ and Ground pins to the second LED line as you would for any receiving Recepta.

5. Run the shielded CAT6 cable between the two RJ45 connectors, or solder it to the pads on a RECEBARE. Keep it within 100 m.

6. Switch on the LED fixture supplies, then power-cycle the left Recepta so its transmitting mode takes effect.

Result: the second LED line follows the first over the differential link. If the far line stays dark, check the power cycle before you check the wiring — a Recepta that was switched to mode 3 without one is still receiving.

11 Maintenance

This chapter keeps the installation within specification over its life.

> **WARNING — LIVE DC TERMINALS AND DATA CABLES**
> The Extensa terminals and every RJ45 link carry voltage for as long as the Extensa is connected.
> **Isolate the supply and verify zero voltage before you disconnect any conductor or RJ45 link, including for inspection.**

11.1 Inspection intervals

Inspect the installation once a year under normal conditions, and every six months in demanding environments — heavy dust, vibration, high ambient temperature or continuous operation. Carry out every inspection with the installation isolated.

- All screw terminals are still tight.
- The RJ45 latches are intact and every plug is fully seated.
- The enclosures and their ventilation openings are free of dust.
- The cable runs show no chafing, tight bends, or shields pulled out of the connector shell.
- No data cable has been moved to run alongside a supply cable.
- There are no visible signs of overheating — discolouration, deformation or scorch marks on an enclosure or on the wiring.

11.2 Cleaning

Clean the products only when the installation is isolated.

- Remove dust with low-pressure dry compressed air or a soft, dry brush.
- Do not use solvents, aggressive cleaning agents, or wet cloths on the electronics or the connectors.
- For a heavily soiled enclosure, wipe the outside with a lightly dampened cloth and let it dry completely before you switch back on.
- Do not clean a Recepta with liquid at all. Use dry air only.

11.3 Re-tightening the terminals

Screw terminals settle after the first thermal cycles, so their tightness is re-checked on a schedule. Re-tighten all screw terminals once after the first few weeks of operation, and at every inspection thereafter. Tighten firmly without deforming the conductor, and confirm with a light pull that each conductor is held by the clamp rather than by its insulation.

11.4 Verification after service

Whenever a unit has been replaced, a terminal loosened or a connector re-made, verify the following before returning the installation to service. Verify the whole installation, not only the channel that was worked on.

- Supply polarity at the Extensa.
- Every switch setting on the replaced unit against the one it replaced.

- One dataline at a time, that each fixture responds on the expected channel.
- Where an NTC is used, that the driver reads a plausible temperature.
- That the power source is free of short circuits before you reconnect it.

12 Troubleshooting

Find the symptom in the table, work through the actions in order, and stop when the symptom clears.

> **WARNING — LIVE TERMINALS DURING FAULT-FINDING**
> Fault-finding often requires the installation to be powered, and the Extensa terminals and RJ45 links carry voltage while it is.
> **Do not touch a terminal or unplug an RJ45 link while the supply is connected. Isolate before you change any wiring.**

Symptom	Likely cause	Action
Fixture dark, receiver indicator dark	No logic power at the receiver	Check the RJ45 link is seated at both ends and that the Extensa is powered.
Fixture dark, receiver indicator lit	The fixture has no supply of its own	Check the fixture's own power supply; receivers do not power fixtures.
Fixture shows another channel's pattern	Receiver set to the wrong dataline	Check the receiver switch setting, then the Extensa output connector pinout.
	The wrong RJ45 output is used	Work the input-to-output mapping out from the output connector pinout.
Flicker, worse when other equipment runs	Unshielded cable, or a shield terminated at one end only	Confirm shielded cable and connectors, with the shield terminated at both ends.
	Data cable running alongside supply cable	Separate the routing, and cross at right angles where they must meet.
Flicker on long runs only	Cable longer than 100 m, or fixture run over 10 m	Measure the runs and shorten them, or add an intermediate stage.
Driver reads an implausible temperature	The NTC channel is still carrying data	Check the Extensa DIP switch is ON for that port and the receiver's NTC is enabled.
One Tricepta output dead, other two fine	It is output 2 and the NTC switch is on	Move the fixture to output 1 or 3, or disable the NTC if it is not needed.
A rotary switch change has no effect	Changed between receiving and transmitting without a power cycle	Power-cycle the Recepta.
Whole cable dead after a Recepta was reconfigured	A Recepta is transmitting onto a bus the Extensa also drives	Isolate, set the Recepta back to a receiving mode, then check both devices for damage.
Works when pressed, fails when released	Loose screw terminal or unlatched RJ45	Isolate and re-make the connection.

13 Decommissioning and disposal

This chapter removes the equipment from service safely and disposes of it correctly.

13.1 Safe removal

> **WARNING — LIVE TERMINALS DURING REMOVAL**
> The Extensa supply terminals and the RJ45 links carry voltage while the supply is connected.
> **Isolate the driver and Extensa supply and the LED fixture supplies, and verify zero voltage at the terminals, before you disconnect any wiring.**

1. Switch off and isolate the driver and Extensa supply and every LED fixture supply.

2. Verify zero voltage at the Extensa terminals.

3. Disconnect the RJ45 links. They carry supply voltage in normal operation, so this step follows isolation, not the other way round.

4. Release the screw terminals and withdraw the conductors.

5. Release the DIN-rail clip and lift the enclosure clear. Withdraw a Recepta from its profile by the board edges.

Result: the equipment is disconnected and removed.

13.2 Disposal and WEEE

Do not dispose of these products with household or general waste. As electronic equipment they fall under the WEEE Directive and must be collected separately.

- Hand the products in at a designated collection point for waste electrical and electronic equipment, or return them to MaNima Technologies BV.
- The Extensa and Tricepta enclosures are UL94-V0 flame-retardant polycarbonate and separate from the board for material recycling.
- The Recepta is a bare assembled PCB and goes to electronic waste as it is.
- Observe the local regulations that apply at the place of disposal.
- Recover packaging materials for recycling where facilities exist.

14 Technical reference

The pinouts below are reproduced in full so they can be used at the terminal block. For the complete specifications, see the Extensa / Recepta / Tricepta datasheet (DS243403).

14.1 Extensa input connectors

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

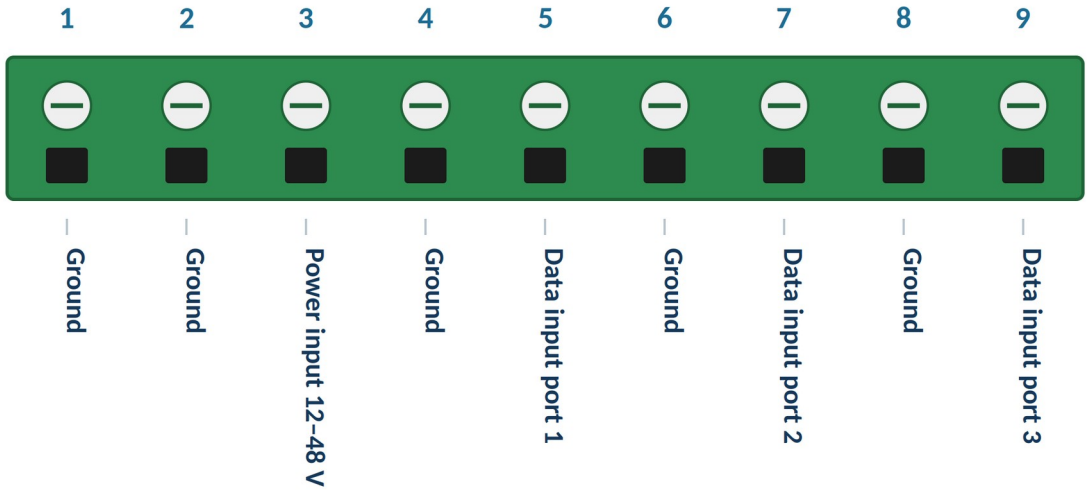


Figure 9 — Extensa input connector CN1, pins 1 to 9.

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

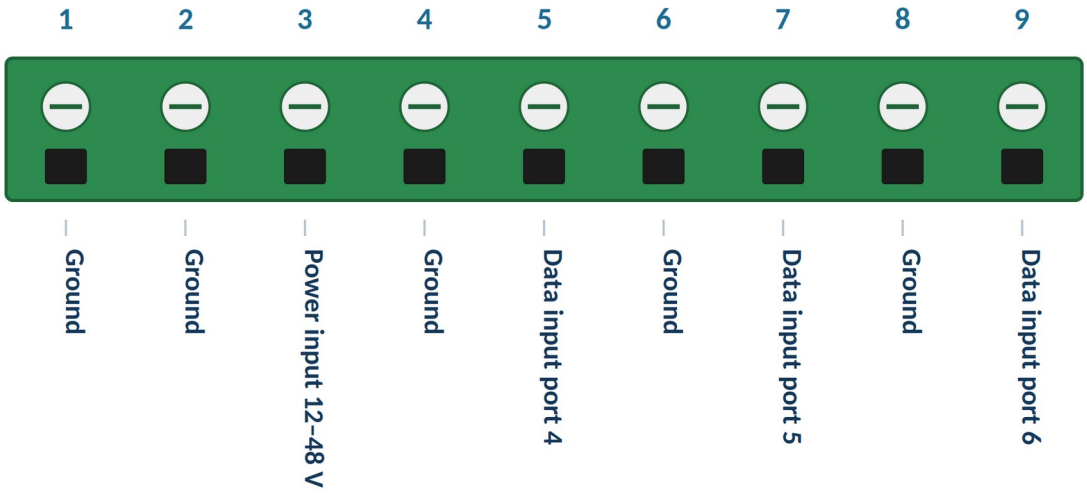


Figure 10 — Extensa input connector CN2, pins 1 to 9.

14.2 Extensa output connectors

This is the table to work from when deciding which output feeds which receiver, and which pair carries an NTC signal.

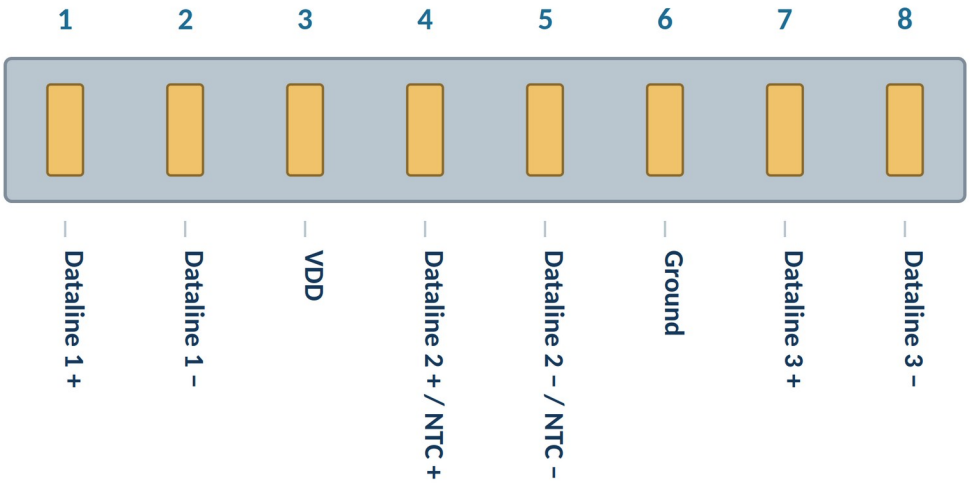


Figure 11 — Pin order of every Extensa RJ45 output, and of the RJ45 input on both receivers. Which D signal sits in each dataline position differs per output — read it from the label on the socket, or from the output table in this section.

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

14.3 Extensa DIP switch settings

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

14.4 Recepta connectors

The RJ45 side is the differential side. It is the input in a receiving mode and the output in a transmitting mode; the signal on each pin is the same either way.

Pin	Signal (RJ45, differential side)	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.*

The 3-pole terminal is the single-ended side, and it reverses with the mode. In a receiving mode it is the output to the LED fixture. In a transmitting mode it is the input, taking the single-ended data from the LED line.

Pin	Signal (3-pole terminal, single-ended side)	Solder pad
1	V+	V+
2	Data — output when receiving, input when transmitting	Data
3	Ground	GND

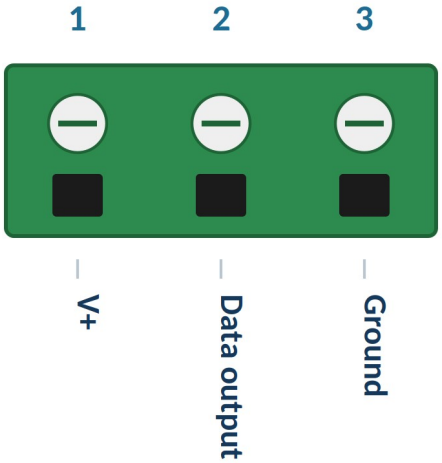


Figure 12 — Recepta 3-pole terminal, pins 1 to 3. Pin 2 is an output in a receiving mode and an input in a transmitting mode.

14.5 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.

14.6 Tricepta connectors

Pin	Signal (RJ45 input J1)
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

Pin	Signal (NTC J3)
1	NTC +
2	NTC -

Pin	Signal (output J2)
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

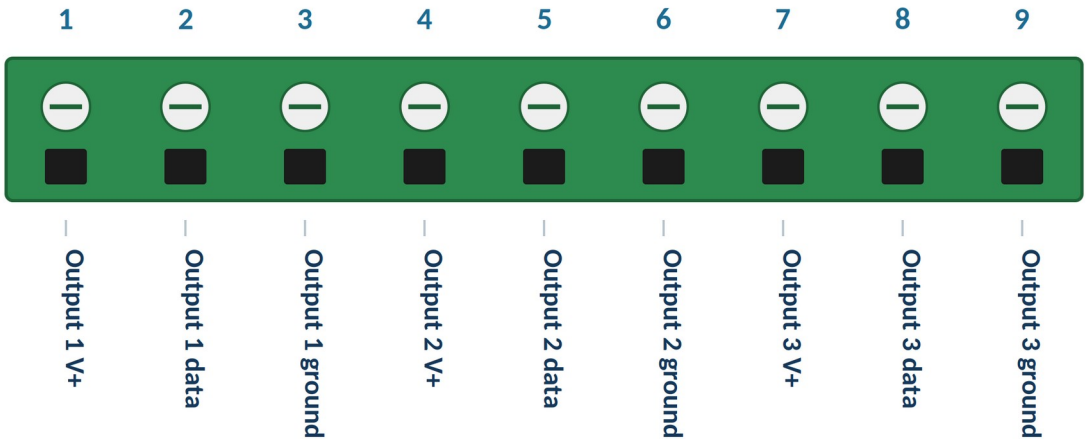


Figure 13 — Tricepta output connector J2, pins 1 to 9.

14.7 Key values

Value	Figure
Supply input, Extensa	12–48 V DC (absolute maximum 9–50 V)
Supply input, Recepta and Tricepta, fixture side	12–48 V DC (absolute maximum 9–50 V)
Supply input, Recepta and Tricepta, cable side	4–6 V, fed by the Extensa or a transmitting Recepta
Maximum cable length, Extensa to receiver	100 m over shielded CAT6
Maximum cable length, receiver to fixture	10 m
Datalines per cable	3
Operating temperature	10–50 °C
Humidity	20–80 %, non-condensing
IP rating, Extensa and Tricepta	IP52
IP rating, Recepta	IP20
Maximum cable length, Recepta to Recepta	100 m over shielded CAT6
Recepta board size	45.6 × 21.5 mm

15 Glossary

Term	Meaning
CAT6 / CAT6A	Cable categories for four-pair twisted-pair cabling. This installation uses the shielded variant, so the pairs sit inside a conductive screen.
D1 to D6	The six data signals on the differential side of the Extensa, printed above the RJ45 sockets. D1 comes from Port 1, D2 from Port 2, and so on.
Dataline	A position inside one cable, numbered 1, 2 and 3. Every RJ45 output carries three of the six D signals, one in each position. Dataline 2, the middle position, is the only one that can carry an NTC signal.
Port 1 to Port 6	The six single-ended data inputs on the Extensa input connectors, as printed on the enclosure.
Differential signal	A signal carried as the voltage difference between two conductors instead of against ground. Noise that reaches both conductors equally cancels out, which is what makes the 100 m reach possible.
DIN 43880	The standard for the built-in enclosure dimensions the DIN-rail products conform to.
DIP switch	A small bank of manual on/off switches on the board, set by hand.
Duty cycle	The fraction of each PWM period during which the output is switched on, and therefore the perceived brightness.
EFT	Electrical Fast Transients — bursts of interference that couple capacitively into wiring, typically from switching equipment nearby.
ESD	Electrostatic discharge. The sudden transfer of static charge, for example from an ungrounded hand to a bare PCB.
NTC	Negative Temperature Coefficient thermistor — a sensor whose resistance falls as temperature rises.
Potential-free	A contact galvanically isolated from the device's own supply, so it carries no reference to it.
PWM	Pulse Width Modulation — switching an output on and off rapidly and varying the on-time to set the output level.
RJ45	The eight-contact modular connector used for the differential link. The shielded version is required here.
SELV	Safety Extra-Low Voltage. A supply whose voltage and isolation are limited so that contact does not present a shock hazard.
UTP splitter	A passive adapter that branches one RJ45 cable into two.
VCC_IO	On a Pollux, the user-supplied rail its PNP outputs switch. Not used by these products.
VDD	The positive logic supply rail carried over the data cable to power a receiver.
WEEE	Waste Electrical and Electronic Equipment — the EU directive governing the collection and recycling of electronic products.

16 Support and tutorials

MaNima publishes wiring diagrams and video tutorials covering the installation on its support pages and its YouTube channel.

Downloads: https://www.manima-technologies.com/support/downloads/

16.1 Contact

Contact	Detail
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17 Disclaimer

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