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Operating instruction

Thunder Ion Control Module

ThunderIon Control Modul

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ThunderIon Control Modul

Preface

Read the whole manual before you install and commission the product.
Follow the instructions set out in this manual to ensure proper operation of the product and to retain your entitlement under the guarantee.
The term Control Module in this user manual refers to the ThunderION Control Module.
The terms of the guarantee are set out in the Relstatic AG General Terms and Conditions of Sale.

1. Introduction

The Control Module forms, together with connected ThunderION anti-static bars, a system for neutralising static electricity.
The Control Module has a switched power supply that converts mains voltage to 24 V DC to operate a maximum of 4 ThunderION units.
LEDs on the Control Module show whether the ThunderION is switched on and whether a fault has occurred.
The ThunderION incorporates functions for being switched on and off remotely, as well as for remote read out of high voltage (not wireless).

2. Safety

- The Control Module is only meant for use with the ThunderION.
- Read the ThunderION user manual as well as this user manual.
- Electrical installation, maintenance and repairs may only be carried out by a skilled electrical fitter.
- Before working on the equipment, disconnect the power supply.
- Ensure that the equipment is properly earthed (see Installation, H4).
  Equipment must be earthed to ensure that it works properly and safely.
- The Control Module is protected against overload by a glass fuse.
- If changes, adjustments etc. have been made without prior consent in writing, or if non-original parts have been used for repairs, the equipment loses its CE approval and will no longer be under guarantee.

3. Technical specifications

Power supply

Mains voltage	100 – 240 V AC
Frequency	50/60 Hz
Max. power consumption	100 W
Mains connection	1.8 m 3-core mains cable.

Output

Output voltage	24 V DC
Max. output current	2.8 A (4x0.7 A)(4 ThunderIONs of max. length)
Max. power output	68 W
Short-circuit protection	By 3.15 AT, 250 V AC glass fuse

Environment

Cooling	Convection
Ambient temperature	0 – 50°C
Sealing	IP-54
Operating environment	Industrial
Input/output connectors	4x connectors required for ThunderION 1x connector required for remote I/O

Local signalling

[Power On] signalling	Green LED
[Remote On] signalling	Green LED
[Local On] signalling	Green LED
[Bar On] signalling	Green LED (4x)
[Bar Fault] signalling	Red LED (4x)

I/O:

Remote On/Off	Control voltage specifications: 10 V DC, 10 mA min. 30 V DC, 25 mA max.
Bar Operating OK	Max. permitted value: 30 V DC, 50 mA (4x)
Power source for I/O	24 V DC, 100 mA max.

4. Installation

4.1. Prior check

- Check whether the Control Module has been received undamaged.
- Check that the details on the packing slip correspond to the details shown on the product received.

If you have any problems and/or if in doubt:
please contact Relstatic AG

4.2. General

Install the Control Module in the desired position within the range of the connection leads of the ionization equipment.
Fit the Control Module so that the switch on the front is clearly visible and can be easily reached.

Warning:
- **Before working on the equipment, disconnect the power supply.**
- **Equipment must be earthed to ensure that it works properly and safely.**
- **Read the ThunderION user manual as well as this user manual.**
- **Electrical installation, maintenance and repairs may only be carried out by a skilled electrical fitter.**
- **Connect only the specified voltages to the control circuits.**

4.3. Assembling the Control Module

- Attach the power unit using the fixing holes in the base plate.

4.4. Connection

4.4.1. Connecting the ThunderION(s)

4.4.1.1. With standard cable

Connect one end of the Control Module connecting cable to the Control Module (6-pole round connector) and connect the other end to the ThunderION (6-pole rectangular connector).
These cables can be delivered by Simco, namely:

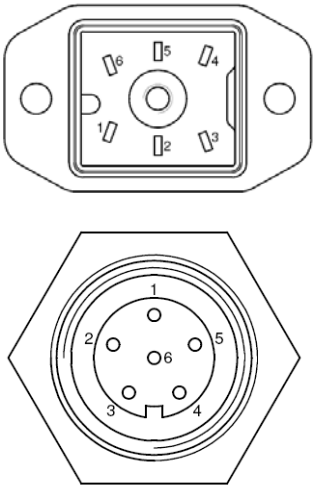
- 6 m Control Module connecting cable	Art. No. 7510014480
- 12 m Control Module connecting cable	Art. No. 7510014490

4.4.1.2. Making your own cables

It is also possible to make the cables yourself. 6x AWG20 unshielded wire is recommended. The connectors can be delivered separately, namely:

-6-pole (bar) Control Module connector	Art. No. 4510140125
-6-pole ThunderION connector	Art. No. 6603060120

This cable must be wired 1:1, i.e. Pin 1 to Pin 1, Pin 2 to Pin 2 etc. (See Fig. 1)



PIN	Function
1	+24 V
2	Remote ON/OFF +
3	HV OK open collector
4	HV OK open emitter
5	Remote ON/OFF -
6	0 V

Fig. 1 Layout of 6-pole connectors: Control Module + ThunderION (chassis front view).

4.4.2. Connecting the Control Module

Route the mains connecting cable to the (mains) supply connection point such that it cannot suffer mechanical damage.

– Connect up the connection cable as shown in Fig. 2, or fit a plug.

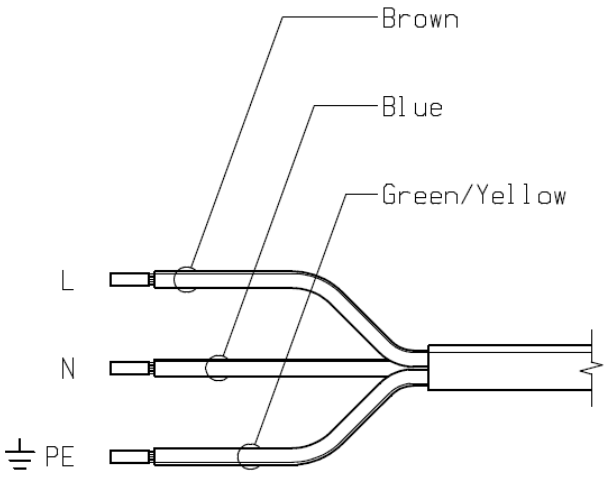


Fig. 2 Mains cable connection

4.4.3. Connecting the I/O Control Module (optional)

For various remote functions, a 12-pole connector is fitted (Fig. 3).
For installation of I/O, 12x 0.12mm^2 unshielded cable is recommended.
The following connectors can be delivered separately:

-12-pole (I/O) Control Module connector Art. No. 4510140130

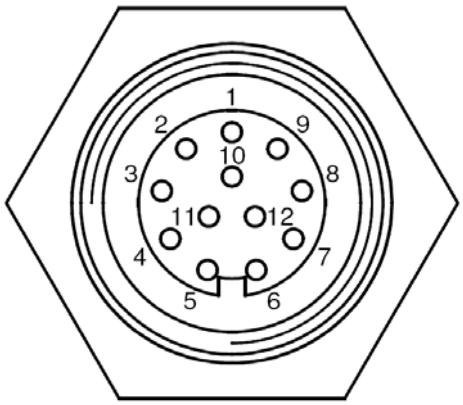


Fig. 3 Layout of 12-pole (I/O) Control Module connector (chassis front view).

PIN	Function
1	Remote on bar 1
2	Bar 1 operating OK
3	Remote on bar 2
4	Bar 2 operating OK
5	Remote on bar 3
6	Bar 3 operating OK
7	Remote on bar 4
8	Bar 4 operating OK
9	Remote on common cathode
10	Bar Operating OK common collector
11	+24 V DC out
12	0 V (internally connected to earth)

4.4.3.1. Connecting the remote ON/OFF function

To use the remote ON/OFF function, the switch behind the stopper must be set (see Fig. 4).
The switch must be moved to the left (remote).

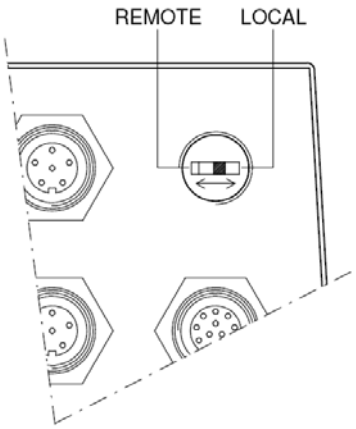


Fig. 4 Remote/local switch

☞ **Attention:**

- **If the remote ON/OFF function is not or no longer required:**
  Set the switch behind the stopper back to local

Connect the remote ON/OFF power via the I/O connector 0 V must be connected to Pin 9 (remote ON common cathode)

The switch voltage must be connected to:
Pin 1 for bar 1
Pin 3 for bar 2
Pin 5 for bar 3
Pin 7 for bar 4
(see also the circuit diagrams in the appendix)

If 0 V is supplied, the corresponding ThunderION is switched off, if 10–30 V DC is supplied, the corresponding ThunderION is switched on. This control voltage is present on the I/O connector (Pin 11 + Pin 12), but can also be supplied externally.

4.4.3.2. Connecting Bar Operating OK

Connect Pin 10 (Bar Operating OK common collector) to the voltage to be switched (max. 30 V). (This voltage is present on the I/O connector (Pin 11 + Pin 12), but can also be supplied externally. This voltage must be present at the open emitter of the optocoupler when the correct output voltages are present on the ThunderIONs.

Open emitters (Bar Operating OK):
Pin 2 for bar 1
Pin 4 for bar 2
Pin 6 for bar 3
Pin 8 for bar 4
(see also the circuit diagrams in the appendix)

5. Commissioning

- Check whether all cables have been connected correctly.
- Switch on the voltage for the power unit or insert the plug into the wall socket.
- Switch on the Control Module.

6. Functional check

6.1. Remote/local switch set to local

When the Control Module is switched on, the [Power ON] LED and [Local ON] should light up. The [Bar ON] LEDs should light up if the corresponding ThunderIONs are connected.
If a [Bar Fault] LED lights up, this means that the corresponding ThunderION is generating insufficient or no high voltage. This may be caused by short-circuited or fouled emitters (see the ThunderION user manual).
The "Bar Operating OK" function can be remotely controlled for each ThunderION. If it is operating correctly, voltage is present at the Bar Operating OK outputs of the I/O connector.

6.2. Remote/local switch set to remote

When the Control Module is switched on, [Power ON] and [Remote ON] should light up.
With the remote/local switch in the remote position, the ThunderION output voltage is switched with the aid of a control voltage (10–30 V). This voltage must be supplied via the I/O connector (see 4.4.3.1.).
If 0 V is supplied, the corresponding ThunderION is switched off and the associated [BAR ON] LED does not light up. If 10–30 V DC is supplied, the corresponding ThunderION is switched on and the associated [BAR ON] LED lights up.
The "Bar Operating OK" function can be remotely controlled for each ThunderION. If it is operating correctly, voltage is present at the Bar Operating OK outputs of the I/O connector.

7. Maintenance

Keep the Control Module clean and dry.
The Control Module does not contain any parts that require maintenance.

8. Faults

Warning:
- **When carrying out work on the equipment, disconnect the power supply.**
- **The work must be carried out by a skilled electrical fitter.**

Depending on the configuration, the cause of a fault can be found in five places, namely:
-the ThunderION(s)
-the wiring between the ThunderION(s) and the Control Module
-the Control Module
-the I/O connector wiring
-peripherals connected to the I/O connector, e.g. a PLC

Table 1 Summary of faults

○ [...] LED does not light up
☼ [...] LED lights up

Led status	Cause	Solution
Control Module: ○ [Power On]	No mains voltage	Switch on mains voltage
	Control Module switched off	Switch on Control Module mains switch
	Fuse in Control Module blown	Replace fuse (3.15 AT, 250 V)
	Control Module faulty	Return Control Module for repair
Control Module: ○ [Bar ON] & ThunderION(s): ○ [ON]	ThunderION(s) not connected	Connect ThunderION(s)
	Control Module - Bar connecting cable faulty	Repair connecting cable (See Section 4.4.1.)
	Control Module is in remote position; an I/O connector is not connected	Place Control Module in local position or connect I/O connector (See Section 4.4.2.1.)
	Control Module is in remote position, Remote on Bar contacts are not activated	Restore input signals for Remote on Bar (See Section 4.4.2.)
	Control Module is in remote position; an I/O connector is wrongly wired	Connect I/O connector wiring according to Section 4.4.2.
	ThunderION faulty	See ThunderION user manual
	Control Module faulty	Return Control Module for repair
Control Module: ☼ [Bar Fault] ThunderION(s): ☼ [Fault]	ThunderION(s) placed too close to conducting parts	See ThunderION user manual
	ThunderION(s) heavily fouled	See ThunderION user manual
	ThunderION(s) faulty	See ThunderION user manual
Control Module: ☼ [Bar Fault] & ThunderION(s): ○ [Fault]	Control Module - Bar connecting cable faulty	Repair connecting cable (See Section 4.4.1.)
Or:	ThunderION(s) faulty	See ThunderION user manual
Control Module: ○ [Bar Fault] & ThunderION(s): ☼ [Fault]	Control Module faulty	Return Control Module for repair

9. Repair

Warning:

- **When carrying out work on the equipment, disconnect the power supply.**
- **Repairs must be carried out by a skilled electrical fitter.**
- **When opening the equipment, you may touch parts under hazardous voltage.**

Repairs which you can carry out on your own:
-Replacing the fuse (3.15 AT, 250 V).
-Replacing/repairing the cabling.
-Replacing sealing caps for connectors and the remote/local switch.

For other repairs, Relstatic AG advises you to return the Control Module.
Pack the Control Module properly and clearly state the reason for return.

10. Disposal

Local environmental regulations apply when disposing of the equipment.

11. Spare parts

Item No.	Description
75.10.01.4480	6 m Control Module connecting cable
75.10.01.4490	12 m Control Module connecting cable
45.10.14.0125	6-pole (Bar) Control Module connector
45.10.14.0130	12-pole (I/O) Control Module connector
69.99.63.0315	5x 20 mm 3.15 AT fuse
93.70.59.3115	Sealing cap for remote/local switch
66.03.06.0128	Sealing cap for 6- and 12-pole connectors

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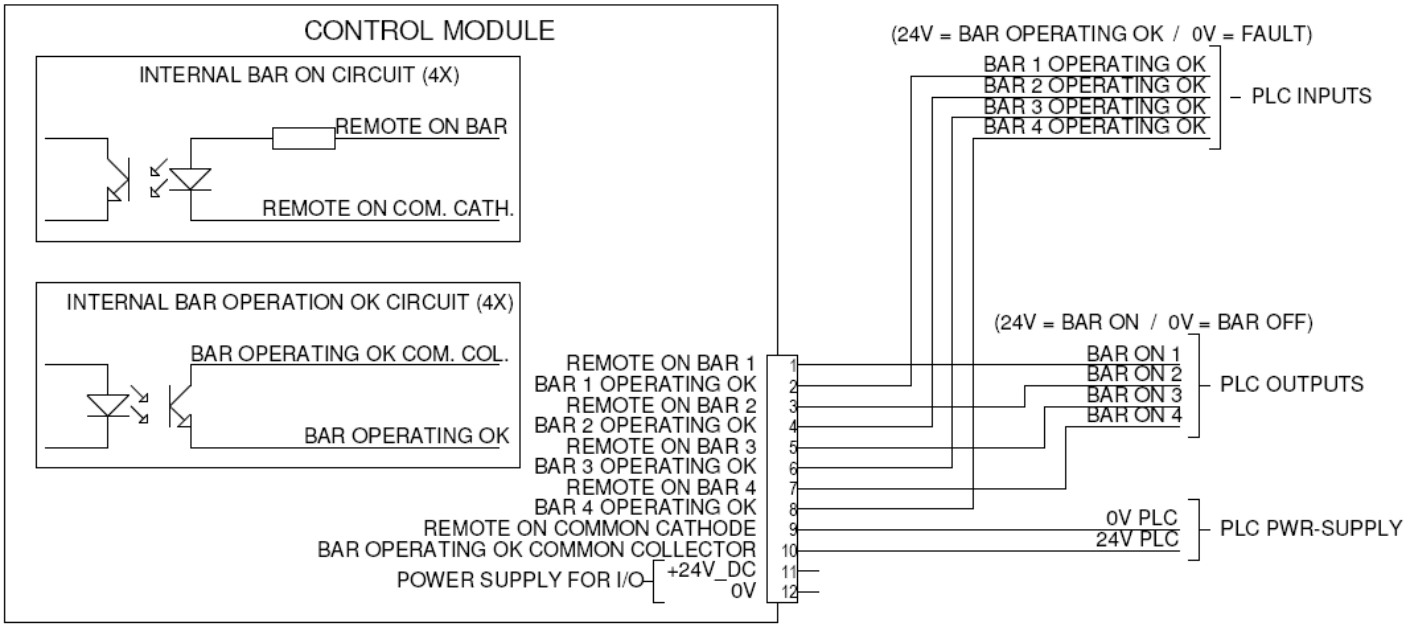
Appendix 1: Control Module/PLC wiring diagram



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Appendix 2: ThunderION system overview