

Webeasy I/O modules

Mounting, wiring and configuration instructions

This document covers the mounting, wiring and configuration of the Webeasy I/O modules. It assumes that you are an engineer, technician or service person who is performing control system installation.

Contents

1 Introduction.....	3
2 General Specifications	4
3 General Features and Configuration	5
4 I/O Wiring and Configuration	6
Connecting a Digital Input (DI / UI)	6
Connecting a Digital Input, pull down (DI / UI).....	7
Connecting an Analog Input (AI / UI)	7
Connecting an Analog Output (AO, AOH)	8
Connecting a Digital Relay Output (DO)	8
Connecting a Digital Triac Output (DO)	9
Connecting a Digital Led Output (DO)	9
5 Switchboard Cabinet mounting and wiring examples	10
Connecting local I/O (via RS485 – Modbus RTU)	10
Connecting local I/O (via Ethernet – TCP/IP)	11
Connecting Remote I/O	12
Connecting Remote I/O with an external power supply.....	12
Connecting WE-RC	13
Connecting WE-IRC.....	14
Connecting WE-TAP	15
Connecting WE-TAP12W	16

The information covered in this document is subject to change without notice.
Conta-Clip assumes no responsibility for any errors that may appear in this document.

1 Introduction

All Web-Easy I/O (WE) modules are designed to be used as local I/O (in the switchboard cabinet) as well as remote I/O (outside of the switchboard cabinet). Each line of stacked modules starts with a WE-CON module which ensures that all local signals are referred to that local Ground reference. The modules are controlled via the Modbus serial communication protocol, which makes integration in a bus orientated system very easy.

When used as local I/O, the modules are interconnected by clicking them together on a DIN-rail. Via the pluggable built-in WE connector, power and the serial bus are automatically connected to the modules, so no extra wiring is needed.

When connection to an outside switchboard application is provided, a Shielded Twisted Pair cable must be used. The ability to also supply the outside module from the switchboard cabinet is determined by the voltage loss occurring. To overcome voltage drop along the supply lines, the outside module may be locally supplied from an extra double insulated AC/DC source.

NOTE: The ground as used within the switchboard cabinet is "common" to the whole application.

Due to potential differences which may arise over longer distances, it is strongly recommended to use galvanic isolation for power and serial bus when using remote I/O.

2 General Specifications

Specifications that are identical for all modules are explained in this chapter.

Housing

Material	Housing: Noryl. Terminals: Polyamid 6.6 V0 / UL94-V0
Protection degree	IP20

Mounting

Click mount	DIN rail TS35
Screw mount	direct on mounting plate, wall or ceiling (3 screws, not included)
Mount location	switchboard cabinet(closed), reduced ceiling, public space
Assembly	In rows with zero spacing. After connecting 15 modules, power must be connected externally again.

Terminals

I/O terminals	0,2 - 2,5 mm ² , screw connection Torque 0,5 Nm / 4 lb.in., insulation stripping length 6mm
Bus- and power terminals	0,2 - 1,0 mm ² , pluggable screw connection (pluggable connector not included), insulation stripping length 7mm

Surroundings requirements

Operating temperature	0°C...+50°C
Storage temperature	-20°C...+70°C
Max. relative humidity	80%, non condensing
Pollution degree	2

Communication

Protocol	Modbus RTU
Interface	RS485, half duplex, not isolated
Baud rate	19K2 bps
Databits	8
Startbits / Stopbits	1 / 1
Parity / Flow control	none / none
Max. nodes	64
Line termination	integrated termination resistors, activate via jumper

Communication cabling

Topology	bus network
Cable type	Shielded Twisted Pair (STP, see Chapter 5)
Rated impedance	150 Ohm (135...165 Ohm)
Max. bus length	500m
Max. cable capacity	160pF/m
Bus connector	pluggable integrated connectors, 1 male and 1 female (modules mounted with zero spacing, no cabling needed) Pin layout: A1 = 24Vac/dc, A2 = system GND, A and B = RS485, A' and B' = filtered RS485
Bus split connector	pluggable male or female screw connector (not included), 0,2..1,0mm ² , insulation stripping length 7mm

Response time

after receipt of a Modbus message:
10ms typical (modules with analog inputs: 100ms typical)

EMC and Safety standards

EMC: IEC/EN 55011, IEC/EN 61326 - Part 1
Safety: EN 50178

3 General Features and Configuration

Features that are identical for all modules are explained in this chapter.

Status Led

Location : upper right corner of the modules

Function : shows the module status:

<i>Led status</i>	<i>Function</i>	<i>comment</i>
green	run	normal operation
green, blinking	override switch signal broken sensor wire	switch(es) not in Auto position* analog RTD inputs only*
red	overload detection	analog outputs only*. Reduce load.
red, blinking	communication error	wrong bus connection or module address
Amber, blinking	broken sensor wire	analog RTD inputs of WE-MULTI-I/O only*

*) not available on all modules

Module address rotary switches

Location : lower right corner of the modules, beneath the module lid.

To access the rotary switches, remove the lid with a small flat screwdriver.

Function : set the address of the modules.

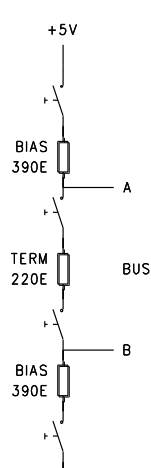
Default : address 0.

Each module must have an unique address. Range: 0 to 99 (decimal).

Example: to set (decimal) address 25, turn S2 to position 2, and S1 to position 5.

Note: the module address is read only once, during power-up of the module. Address changes during power-on will have no effect.

Termination resistor (TERM) and Bias resistor (BIAS) activation



Location : beneath the module lid. Remove the lid with a small flat screwdriver.

Function : Activating TERM terminates the bus line to prevent signal reflections. This however leads to an undefined idle state. Activating BIAS ensures a defined idle state on the bus when TERM is activated.

Activation : Dipswitches / jumpers: ON=activated; OFF=de-activated.
Diagram on the left:

Both poles of dipswitch TERM (on WE-CON, WE-CON-IP) must be either simultaneously ON or OFF.

Both poles of dipswitch BIAS (on WE-CON-IP) must be either simultaneously ON or OFF.

All other WE-modules (TERM only):

Jumper on 3-pole pin header, with position ON and OFF

Note: jumper not placed = OFF.

Default : TERM: OFF. BIAS: ON.

Note: If the total bus length is < 25m, it is not required to activate TERM at both ends of the bus.

Note: Activate TERM only at the *first* and the *last* module of the bus network. This means that on only 2 modules TERM is activated. On all other modules TERM must be de-activated.

Be sure to de-activate other bias systems on the bus (e.g. bias system in a master etc.).

The first WE module to start a bus with (nearest to the PLC/IPC/Other master) must be a WE-CON, see chapter 5, diagram 'Connecting local I/O'. The bus cable length between the PLC/IPC/Other master and the first module (WE-CON) must be < 0,5m.

The **WE-CON** provides easy connection for power and bus on standard terminals, termination resistor circuit, extra bus filtering, and power overvoltage protection.

The **WE-CON-R** is identical to the WE-CON, but lacks the termination resistor circuit, the extra bus filtering and the power overvoltage protection.

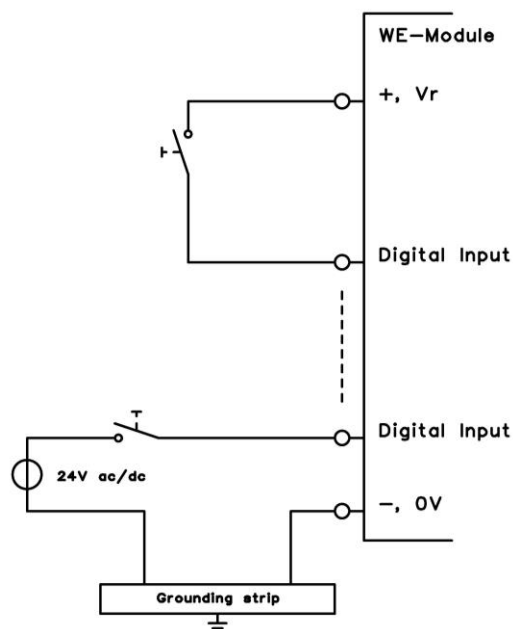
The last module in the bus can be any WE I/O module.

4 I/O Wiring and Configuration

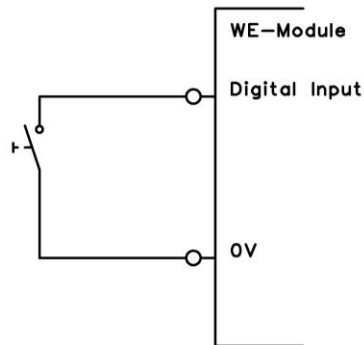
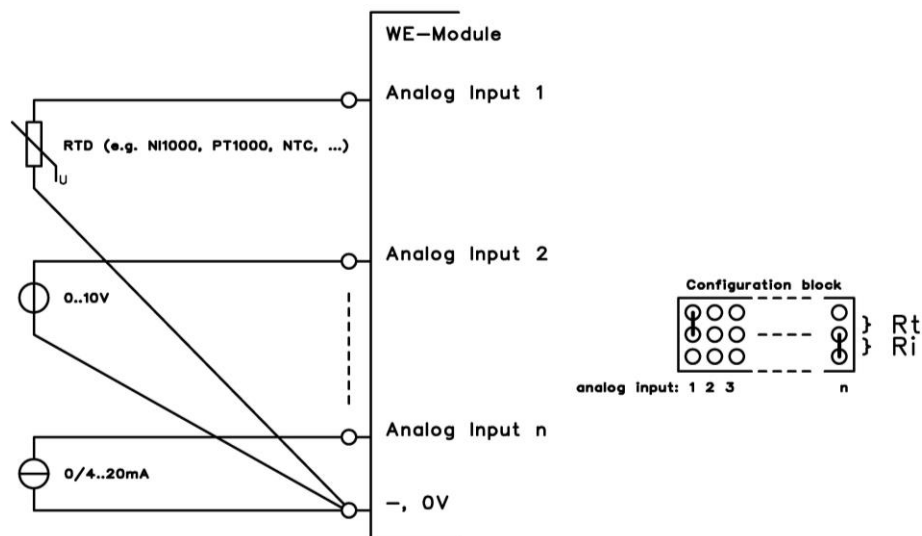
Connecting a Digital Input (DI / UI)

DI: WE-10DI, WE-6DOH-12DI-E, WE-MULTI-IO

UI: WE-MULTI-IO, WE-LIGHT-DIM



Note: UI input: WE-MULTI-IO: configure UI as 0..10V input (the resistor plug-in socket must be empty). Limitation: DC input only.

Connecting a Digital Input, pull down (DI / UI)**DI:** WE-FANCOIL, WE-LIGHT-DIM, WE-LIGHT, WE-SUNBLIND**UI:** WE-IRC**Note:** UI input: WE-IRC: configure UI as RTD input (default).**Connecting an Analog Input (AI / UI)****AI:** WE-8AI**UI:** WE-MULTI-IO, WE-IRC, WE-LIGHT-DIM**Configuration block: configure each analog input as desired:**

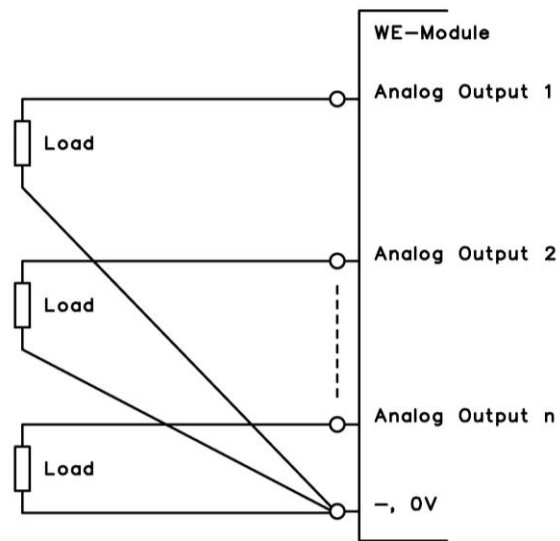
0..10V	No plug-in resistor (The plug-in socket must be empty)
0/4..20mA	Place plug-in resistor in the Ri position (value: see Webeasy module datasheets)
RTD	Place plug-in resistor in the Rt position (value: see Webeasy module datasheets)

The analog plug-in configuration block is located beneath the module lid. To access the block, remove the lid with a small flat screwdriver.

Connecting an Analog Output (AO, AOH)

AO: WE-IRC, WE-4DO+2AO, WE-LIGHT-DIM, WE-4AO

AOH: WE-4AOH-3DO, WE-MULTI-IO



Analog Output (AOH) with Auto-Manual override switch and manual potmeter output adjust

Location : switch and potentiometer direct accessible on top of the module

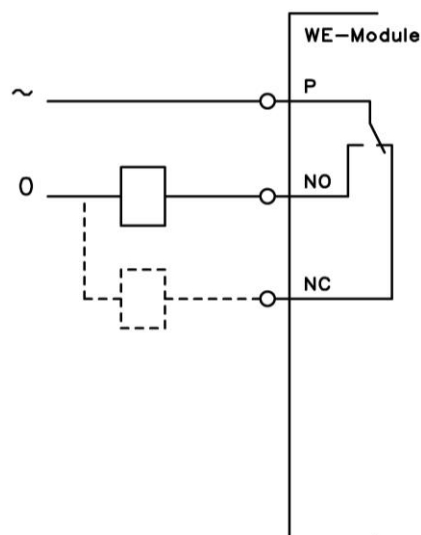
Function : intervention per channel:

- Auto (default) normal operation; output controlled by system
- Manual output controlled by potentiometer position

Connecting a Digital Relay Output (DO)

DO: WE-4DO, WE-4AOH-3DO, WE-MULTI-IO, WE-FANCOIL, WE-LIGHT-DIM, WE-LIGHT, WE-SUNBLIND

DOH: WE-6DOH-12DI-E, WE-MULTI-IO

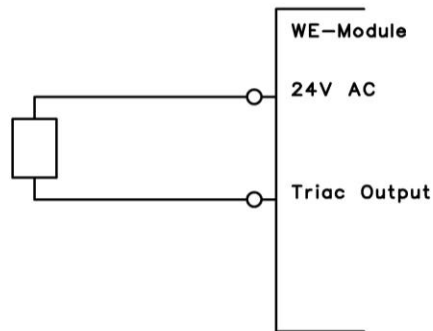


Digital Output (DOH) with Auto-Off-Manual override switch

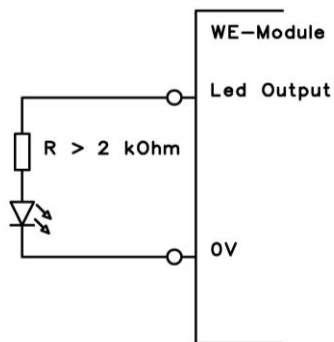
Location : direct accessible on top of the module

Function : intervention per channel:

- Auto (default) normal operation; output controlled by system
- Off output off (hard-wired)
- Manual output on (no separate power supply system)

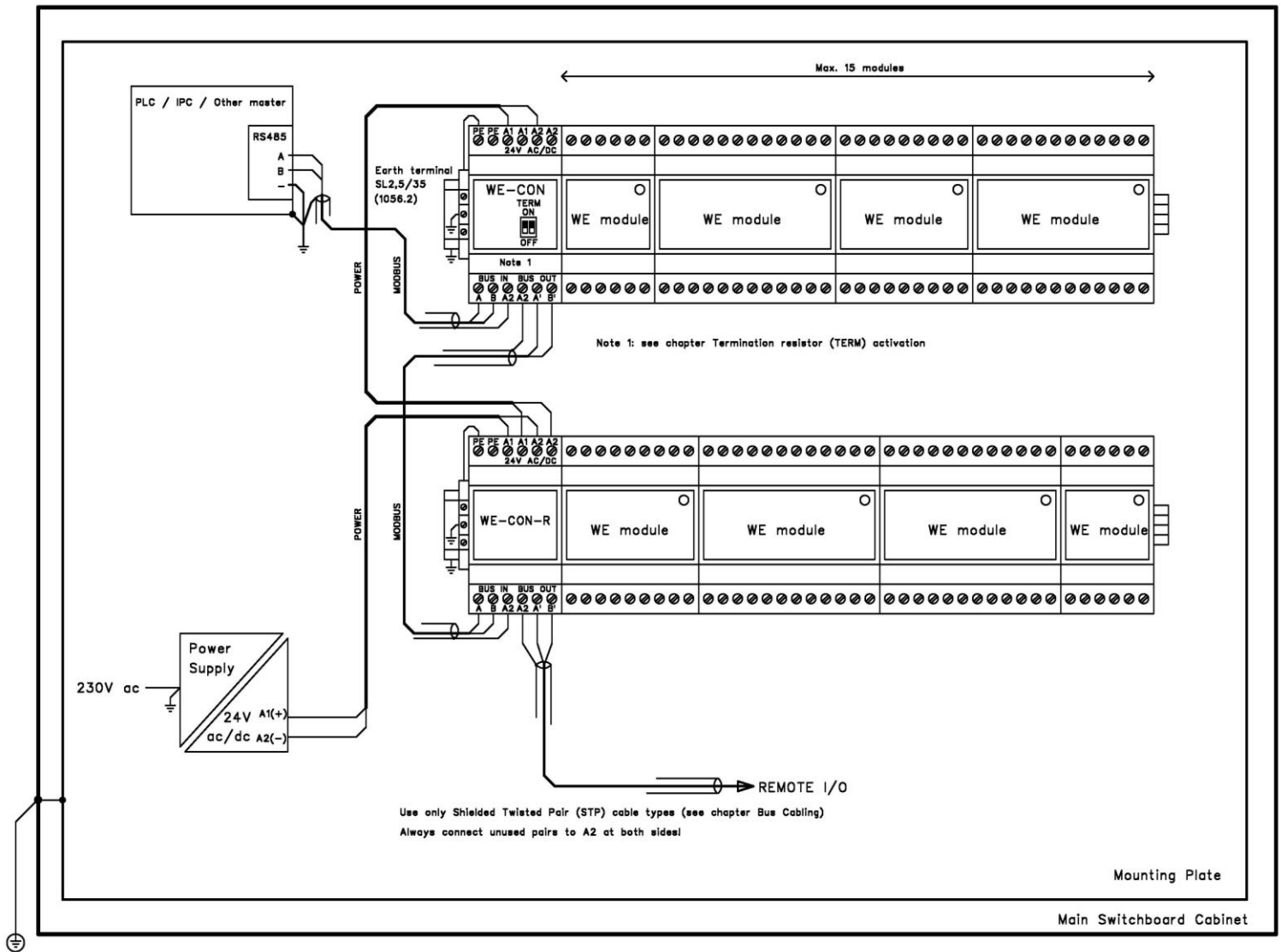
Connecting a Digital Triac Output (DO)**DO:** WE-IRC, WE-4DO†-2AO

Note: WE-4DO†-2AO: all outputs are sourced via an external 24V AC power supply, that must be connected to the 24V/0V screw terminals.

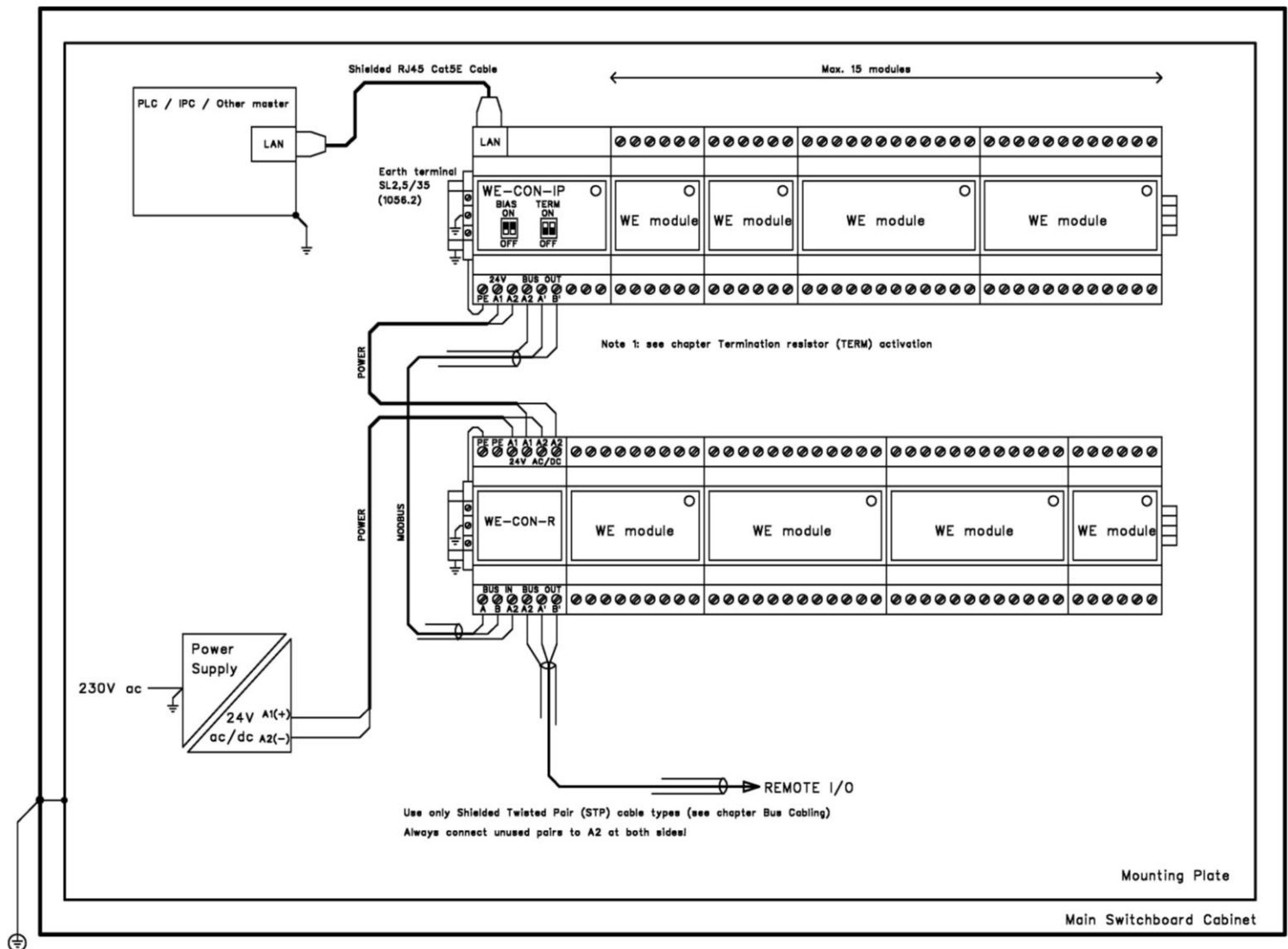
Connecting a Digital Led Output (DO)**DO:** WE-IRC

5 Switchboard Cabinet mounting and wiring examples

Connecting local I/O (via RS485 – Modbus RTU)



Connecting local I/O (via Ethernet – TCP/IP)



Bus Cabling

Connect the bus cable according the mounting and wiring instructions in this chapter.

Use only Shielded Twisted Pair (STP) cable types.

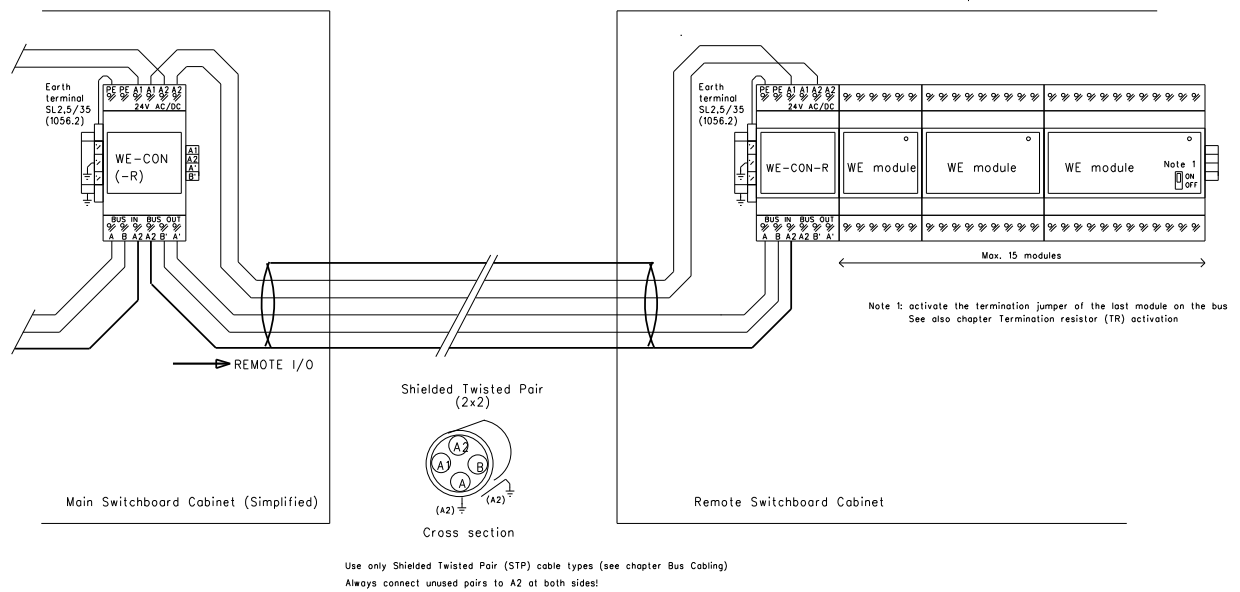
Compose the bus/power lines in pairs as shown in following diagrams.

When using a STP with more pairs, connect the unused pairs to 'A2(-)' !

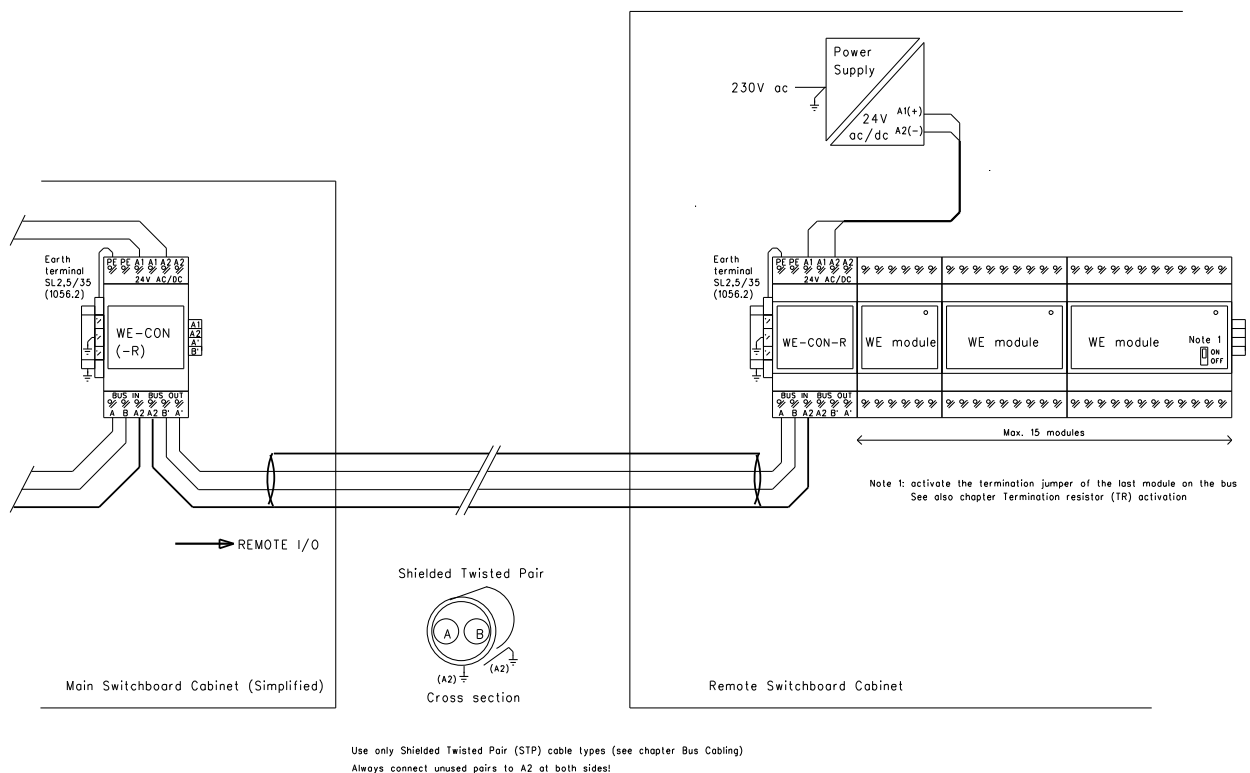
General guidelines for good EMC practice.

- Do not place signal lines and 230/400V power lines in the same cable duct, unless these are shielded. Keep a distance of at least 15cm between signal lines and power lines. Do not run signal lines and power lines in parallel. When using shielded Quad cable or STP, of which the shield is grounded to the system at both ends, the cables can be routed everywhere (less restrictive).
- Equip relays and (power) switches with RC-, varistor or other spark quenching circuits.
- Use star-point with simple wire to grounding strip. As long as the grounding strip is equipotential" to all I/Os, no other restrictions apply. The filter module in front of the stacked modules shall be grounded to the common ground plane.
- Near the WE modules, the cable shields used on interface and/or I/O signals shall be connected to "gnd" or the chassis i.e. DIN rail to which the modules are mounted.

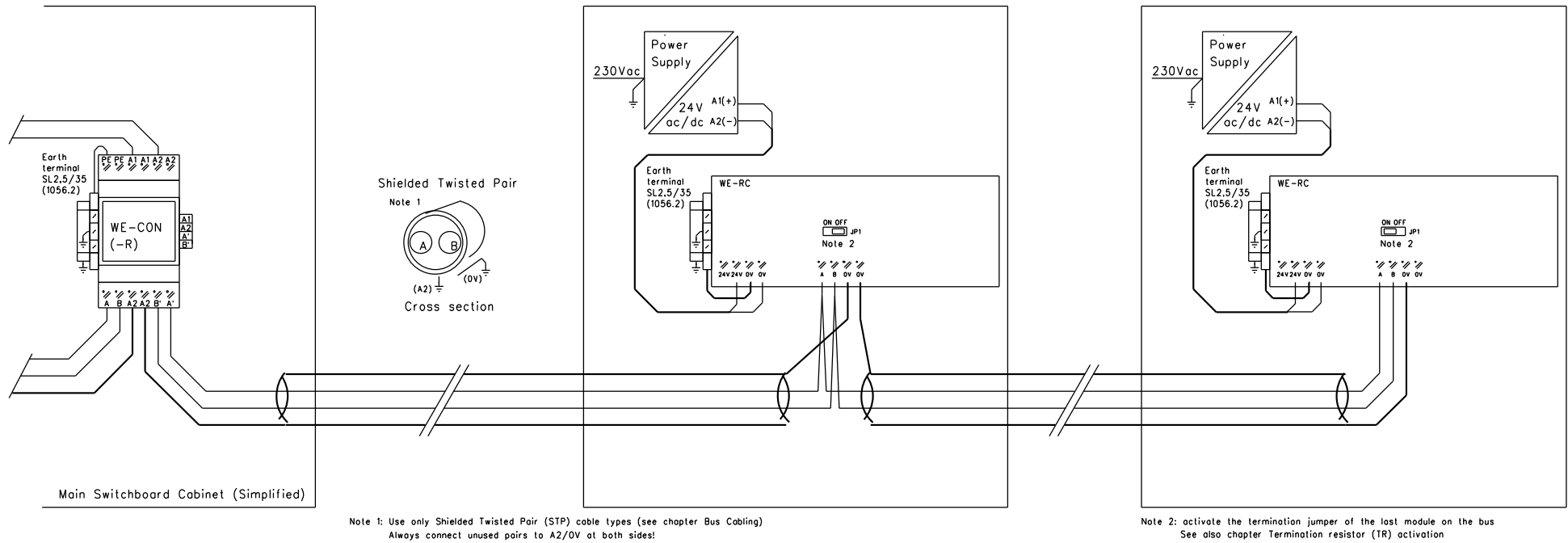
Connecting Remote I/O



Connecting Remote I/O with an external power supply

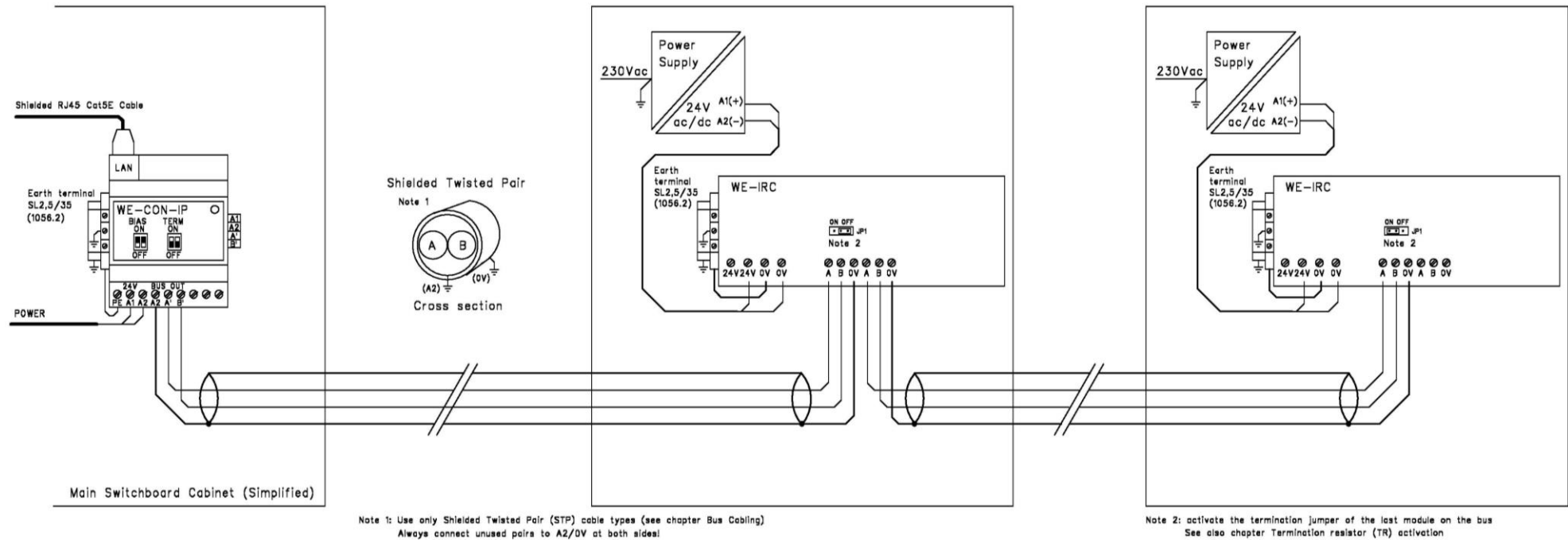


Connecting WE-RC



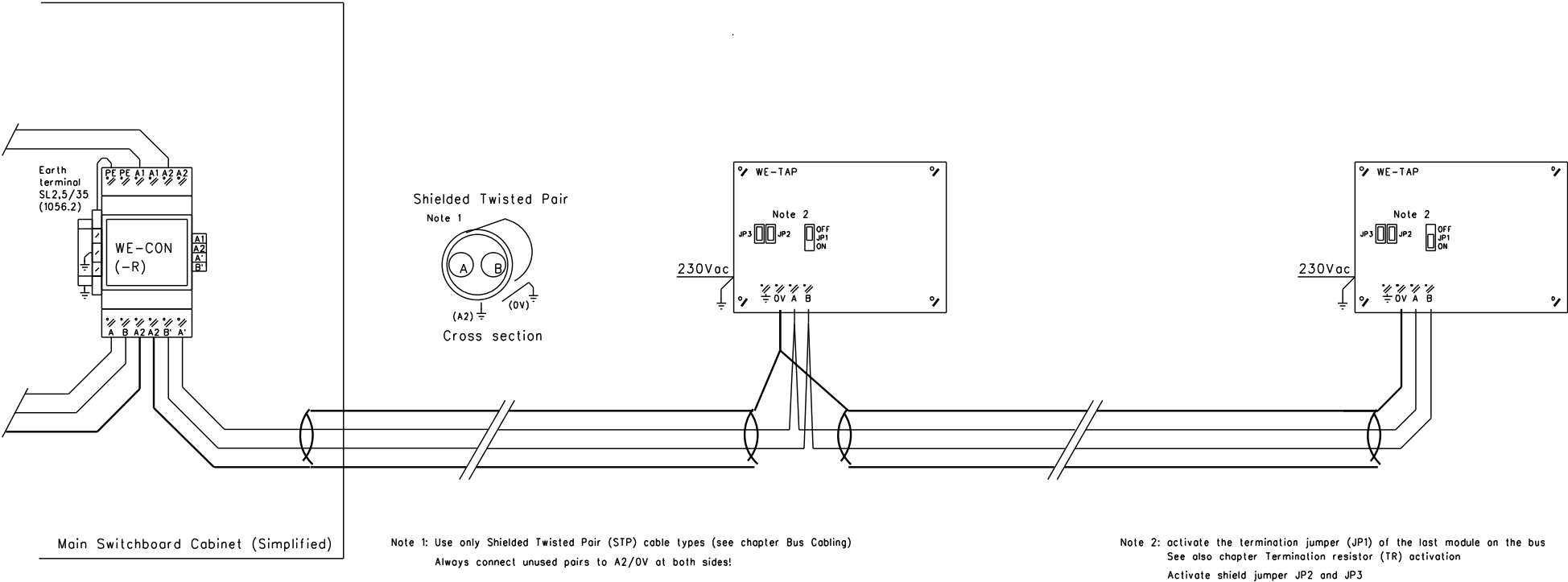
In general power will be supplied to the WE-RC modules via a separate power cable, due to the higher current capabilities of the WE-RC.

Connecting WE-IRC



In general power will be supplied to the WE-IRC modules via a separate power cable, due to the higher current capabilities of the WE-IRC.

Connecting WE-TAP



Connecting WE-TAP12W

