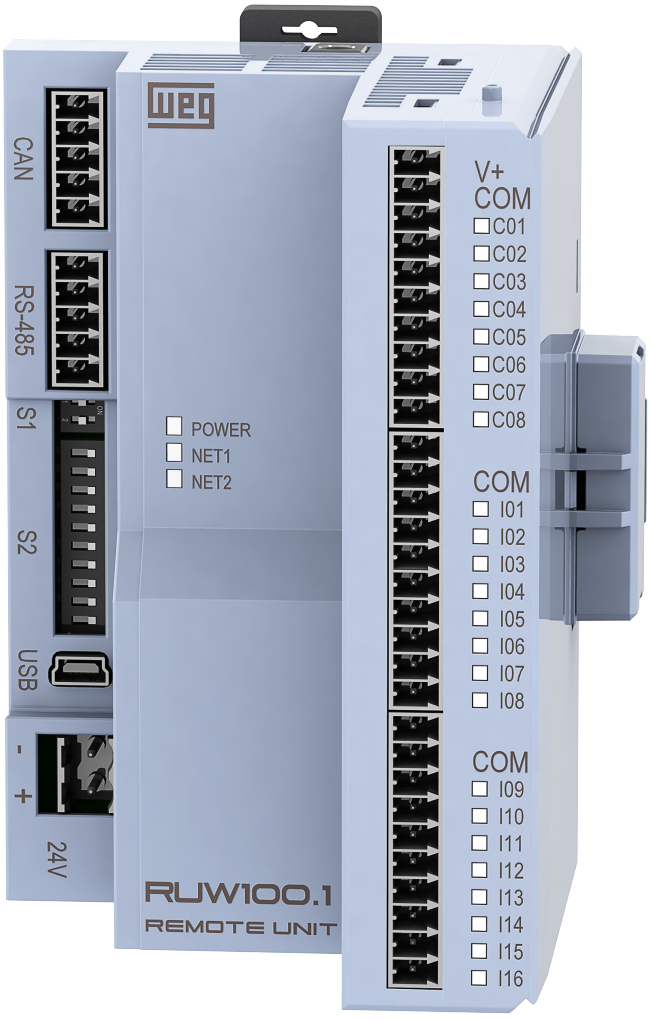
WEG Remote Unit

RUW-100

User Manual



User Manual

Series: RUW100

Language: English

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Summary of the Revision

The information below describes the revisions made to this manual.

Version	Revision	Description
1.0x	R00	First edition
2.0x	R01	PLC function was added; LED color and functionality were changed.
2.0x	R02	Changes in the Item 11.2 ACCESSORY LIMIT on page 11-2

1 SAFETY INSTRUCTIONS

This manual contains the information necessary for the correct use of the RUW100 remote unit.

It was developed to be used by people with proper technical training or qualification to operate this kind of equipment.

This manual presents all the functions and parameters of the RUW100, but it is not intended to explain every possible application of the RUW100. WEG will not take any liabilities for applications not described in this manual.

This product is neither intended for applications whose purpose is to ensure physical integrity and/or life of people, nor for any other application in which a fault of the RUW100 may create a situation of risk to the physical integrity and/or life of people. The designer who uses the RUW100 must provide ways to ensure the safety of the installation even in case of a failure of the remote unit.

1.1 SAFETY WARNINGS IN THE MANUAL

The following safety warnings are used in this manual:

DANGER!
The procedures recommended in this warning aim at protecting the user against death, serious injuries and considerable material damages.

ATTENTION!
The procedures recommended in this warning aim at preventing material damages.

NOTE!
The text aims at providing important information for the full understanding and proper operation of the product.

1.2 SAFETY WARNINGS ON THE PRODUCT

The following symbols are attached to the product as safety warnings:

Mandatory connection to the protective earth (PE).

1

1.3 PRELIMINARY RECOMMENDATIONS

DANGER!
Only qualified personnel, familiar with the RUW100 and related equipment, must plan or perform the installation, operation and maintenance of this device. Such personnel must follow the safety instructions described in this manual and/or defined by local standards.
Failure to comply with the safety instructions may cause risk of death and/or equipment damage.

NOTE!
For the purposes of this manual, qualified personnel are those trained in order to be able to:
1. Install, ground, power up and operate the RUW100 in accordance with this manual and the safety legal procedures in force.
2. Use the protective equipment in accordance with the relevant standards.
3. Give first aid.

ATTENTION!
Electronic boards have components sensitive to electrostatic discharges. Do not touch directly the component parts or connectors. If necessary, first touch the grounded metallic frame or use a proper grounding strap.

NOTE!
Read the whole user manual before installing or operating the RUW100.

2 GENERAL INFORMATION

2.1 ABOUT THE MANUAL

This manual presents the main technical characteristics, procedures for the installation and start-up, and instructions for troubleshooting the most common problems of the RUW100.

For information on parameter setting, other functions, accessories and operating conditions, refer to the following manuals:

- Parameter manual.
- CANopen communication manual.
- Modbus communication manual.
- Help online included in the WPS.
- Accessory manual.

All manuals are available for download on the WEG website - **www.weg.net**.

2.2 TERMS AND DEFINITIONS USED IN THE MANUAL

A: amps.

°C: degree Celsius.

DC: direct current.

kg: kilogram = 1000 grams.

kHz: kilohertz = 1000 hertz.

mA: milliamp = 0.001 amp.

FLASH memory: non-volatile memory that can be electrically written and erased.

min: minute.

ms: millisecond = 0.001 seconds.

s: second.

USB: universal serial bus - type of serial communication interface designed to work according to the "Plug and Play" concept.

V: volts.

Vdc: volts direct current.

Ω: ohms.

RTD: resistance temperature detector.

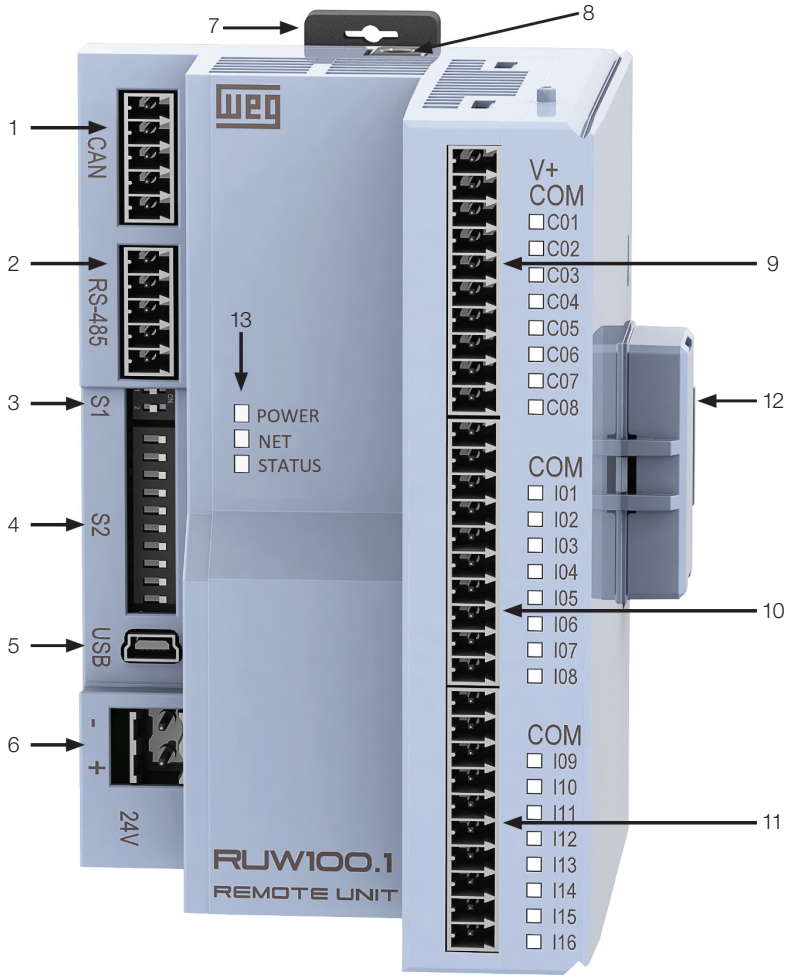
I/Os: inputs/outputs.

CAN: controller area network.

2.3 ABOUT THE RUW100

The RUW100 remote unit is a slave device which allows the expansion of digital and analog inputs and outputs, thermocouples, PT100, PT1000, load cells and relays in an automation system based on the CANopen and Modbus RTU protocol using the CAN and RS485 physical means. The RUW100 can be used in conjunction with a CANopen or Modbus master such as the PLC300, SCA06, etc. It has plug-in connectors, and it can be mounted on a 35 mm DIN rail or directly on the panel.

In addition to operating as a remote unit, the RUW100 can work as a micro PLC running a ladder program created through the WPS (Weg Programming Suit) programming software, available at **www.weg.net**.



1 - CAN connector
2 - RS485 connector
3 - Switch S1: RS485 termination resistors
4 - S2 switch: configuration of CAN and RS485 networks (address, baud rate, etc.)
5 - USB connector
6 - +24 Vdc power supply
7 - Latch/bracket for mounting on 35 mm DIN rail or panel

8 - Ground connection
9 - Digital Outputs connector pins 01 to 10 (*)
10 - Digital Input/Output connector pins 11 to 20 (*)
11 - Digital Input connector pins 21 to 30 (*)
12 - Closure of the communication bus between accessories
13 - Power LED: signals that the remote is energized
NET and STATUS LED: status of the device and networks
See Chapter 8 LEDS on page 8-1

(*) Optional items of models RUW100.10 and RUW100.20.

Figure 2.1: *RUW100*

2.4 RUW100 PROGRAMMING

The RUW100 can run a small ladder program with different tasks, such as control of digital and analog inputs and outputs, PID control blocks, timers, filters etc.

In order to develop the ladder program, the WPS software (WEG programming suit) 2.60 or later must be used. In addition to the ladder programming, the WPS allows monitoring and changing parameters, monitoring the ladder program and user-created variables, creating parameter and variable graphs etc.

For further details, see the WPS Online Help.

The RUW100 parameters can also be set via network master, not requiring the WPS software.

2.5 BOOTLOADER AND FIRMWARE

The Bootloader is an auxiliary program that executes the main firmware of the RUW100, which, in turn, executes all the functionalities.

It is through the Bootloader that a new firmware can be uploaded to the RUW100 via USB using the WPS programming software.

You can see the Bootloader version on parameter P0540, and the main firmware version on P0500.

NOTE!
If during the firmware update/upload the process is interrupted for any reason, the NET and STATUS LEDs will be blinking together every 1s and the device version will show V20.xy. In this case, just repeat the firmware update process through the WPS.

2.6 MODELS

- RUW100.0: this model does not have its own digital inputs and outputs, requiring the connection of expansion boards.
- RUW100.1: model with 8 isolated and protected PNP digital outputs, 24 Vdc, maximum current of 500 mA each and 16 bidirectional digital inputs.
- RUW100.2: model with 10 isolated, bidirectional, unprotected, 500 mA digital outputs and 14 bidirectional digital inputs.

2.7 RECEIVING AND STORAGE

The RUW100 is supplied packed in a cardboard box. At the receipt of the product, check if:

- The identification label of the RUW100 corresponds to the purchased model.
- Damages during transportation.
- If any problem is detected, report it to the Carrier immediately.

If the RUW100 is not installed soon, store it in a clean and dry location [temperature between -25 ºC and 60 ºC (-13 ºF and 140 ºF)] with a cover to prevent dust accumulation inside.

2.8 CONTENT OF THE PACKAGE

- RUW100 - CANopen Remote Unit with plug-in connectors.
- Installation, configuration and operation quick guide.
- Grounding plates.
- Closure of the communication bus.

3 MECHANICAL INSTALLATION

The directions and suggestions must be observed so as to ensure the safety of people and the proper operation of the equipment.

3.1 MOUNTING

The RUW100 and its accessories can be installed on a 35 mm DIN rail as shown in Figure 3.1 on page 3-1. In order to do so, proceed as follows:

1. Move the latches away.

2. Position the remote unit on the DIN rail.

3. Close the latches again.

Figure 3.1: *Mechanical mounting on DIN rail*

In addition to the DIN rail, the RUW100 can also be directly mounted on the panel with M3 screws, as shown in Figure 3.2 on page 3-1, following the procedure below:

1. Move the latches away.

2. Screw the remote unit on the panel.

Figure 3.2: *Mounting directly to the panel*

3.2 DIMENSIONS

3.2.1 RUW100 Dimensions

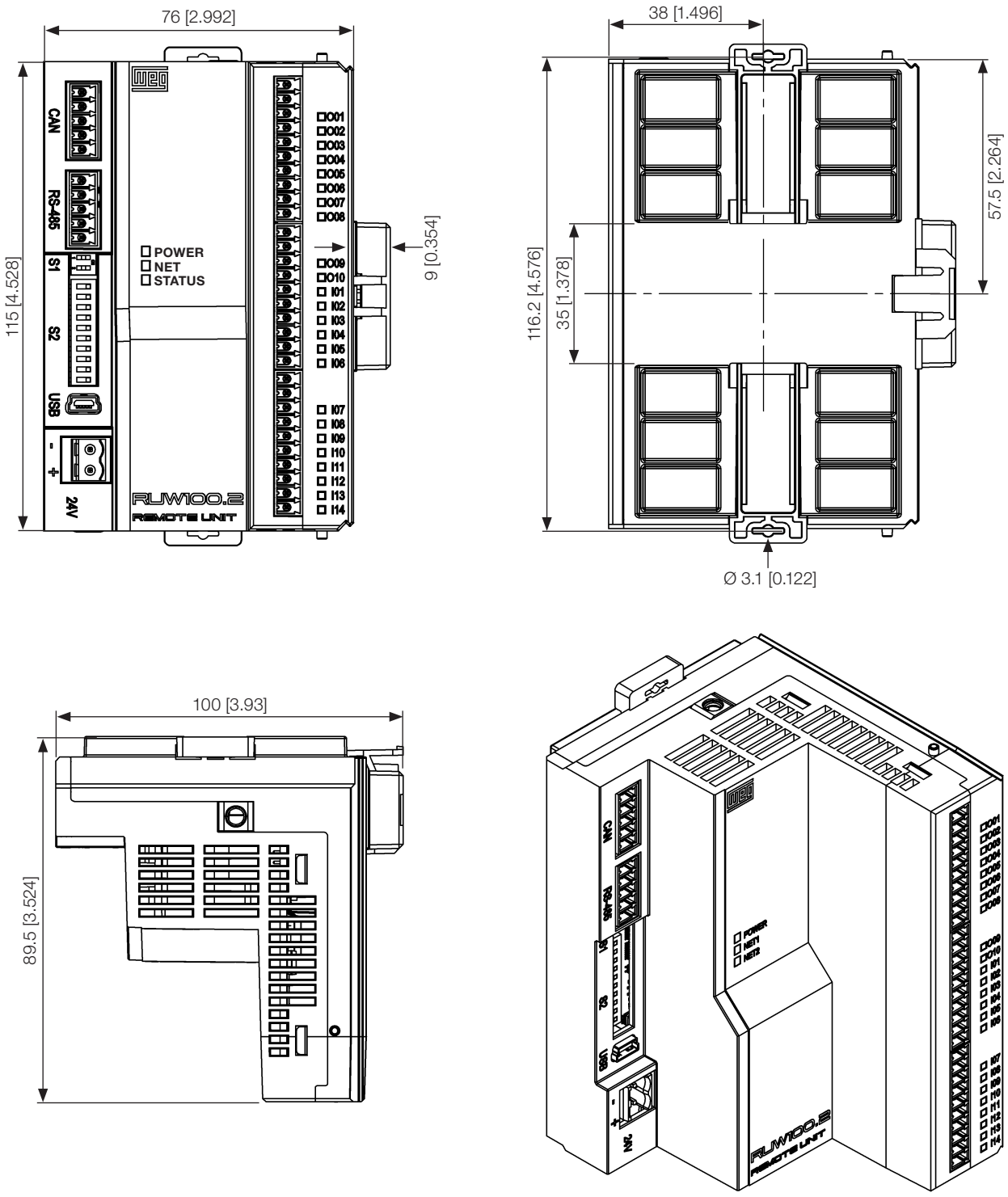


Figure 3.3: *RUW100 dimensions in mm [in]*

3.2.2 Accessory Dimensions

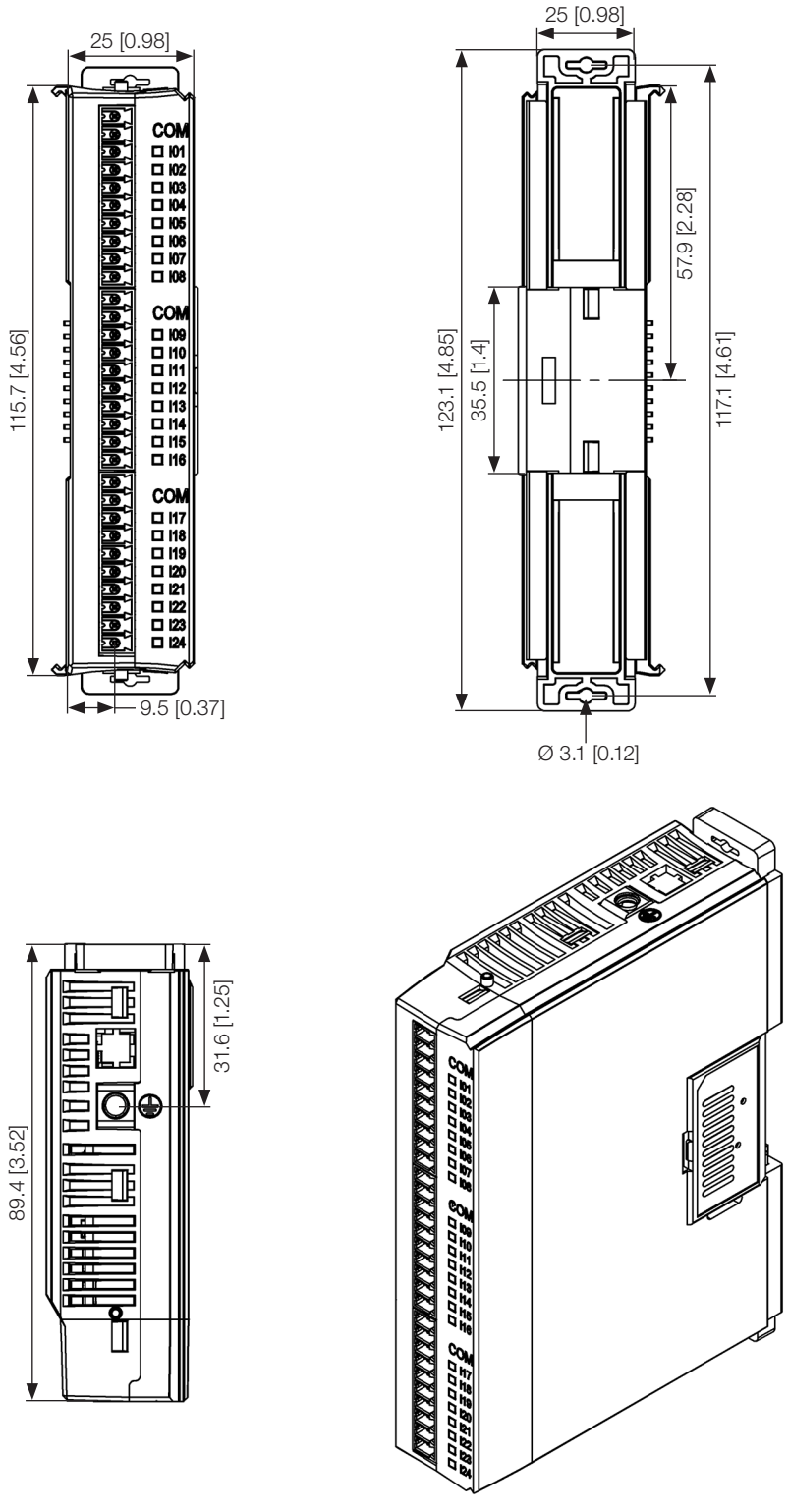


Figure 3.4: *Accessory dimensions in mm [in]*

3.3 ACCESSORY CONNECTION

The accessories must be inserted in the direction of the Figure 3.5 on page 3-4. Before adding a new accessory, the closure of the modules must be removed and reinstalled after connecting the accessory. Connecting the closure of the RUW100 communication busbar is essential for its operation.

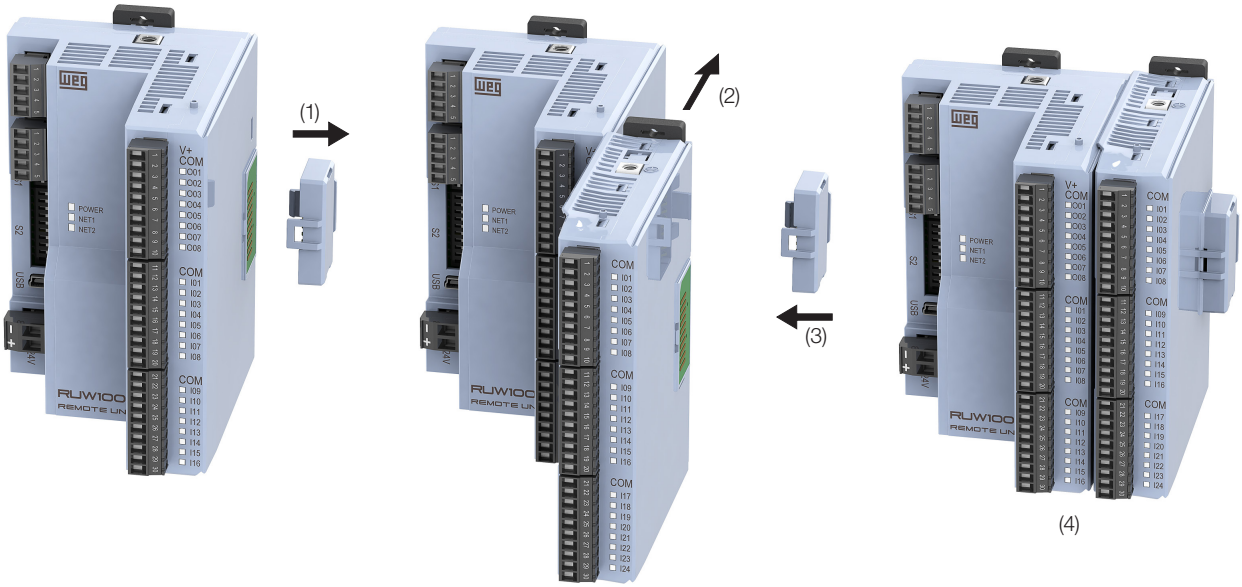


Figure 3.5: *Accessory connection*

4 ELECTRICAL INSTALLATION

4.1 POWER SUPPLY

The RUW100 must be powered by an external 24 Vdc power supply with a current capacity of at least 1 A. The minimum supply voltage is 20.4 Vdc, and the maximum is 28.8 Vdc.

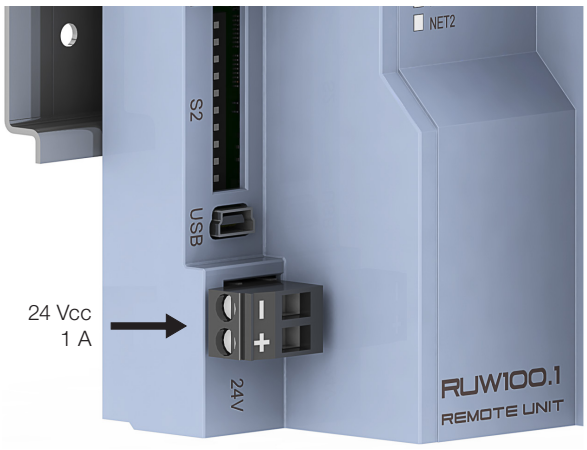


Figure 4.1: *Power supply*

4.2 GROUNDING CONNECTION

Use the screws indicated on Figure 4.2 on page 4-1 to ground the product. The screws are connected internally; however, the connection of both ensures better grounding.

For analog modules, it is recommended to use shielded cables properly connected to the ground-mat.

The shield of the analog cables must be grounded using the metal clamp that comes with the product, according to Figure 4.2 on page 4-1. The grounding of the shield minimizes occasional electromagnetic interferences.

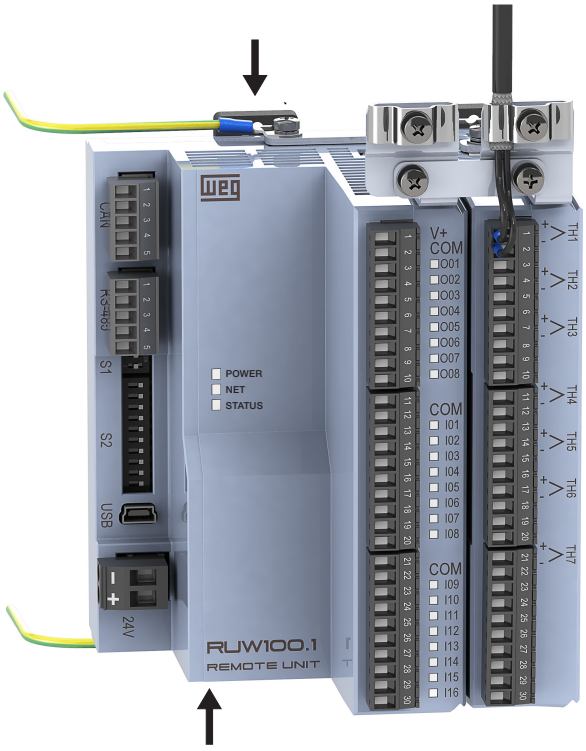


Figure 4.2: *Shield and grounding*

5 CAN COMMUNICATION INTERFACE

The RUW100 module has isolated CAN and its own internal power supply. The 5-way plug-in connector to connect the Modbus network has the following pinout:

Pin	Name	Function
1	COM	Common in the CAN network (connected to the negative pole of the CAN network)
2	CAN_L	CAN_L communication signal
3	SHIELD	Cable shield
4	CAN_H	CAN_H communication signal
5	NC	Not connected (can receive the positive pole of the CAN network)

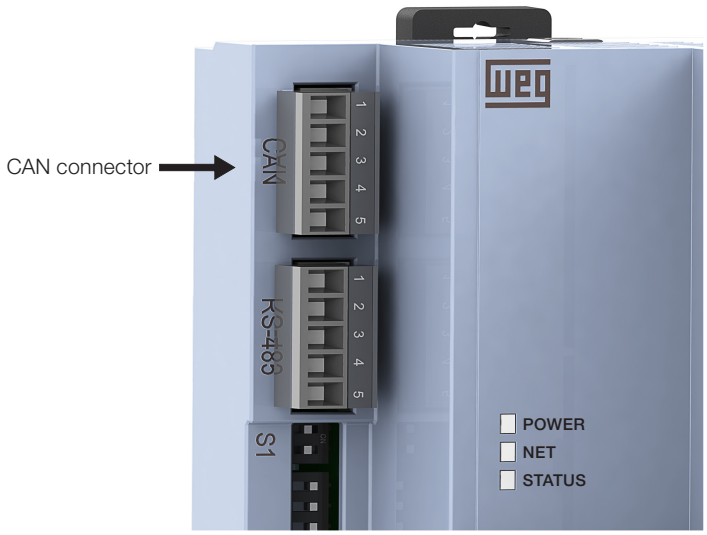


Figure 5.1: *CAN connector*

The RUW100 has an internal power supply for the CAN network, so it is not necessary for pin 5 to be connected. Nevertheless, it is recommended that pin 1 (COM) be connected to the master and the other slaves to leave the CAN network in the same voltage reference.

A terminal resistor (120 Ω) must be used in the end devices connected to the CAN network. This resistor must be connected between the pins 2 and 4 of the connector.

The CANopen Network has the settings of the address and baud rate through the group of DIP Switches S2.

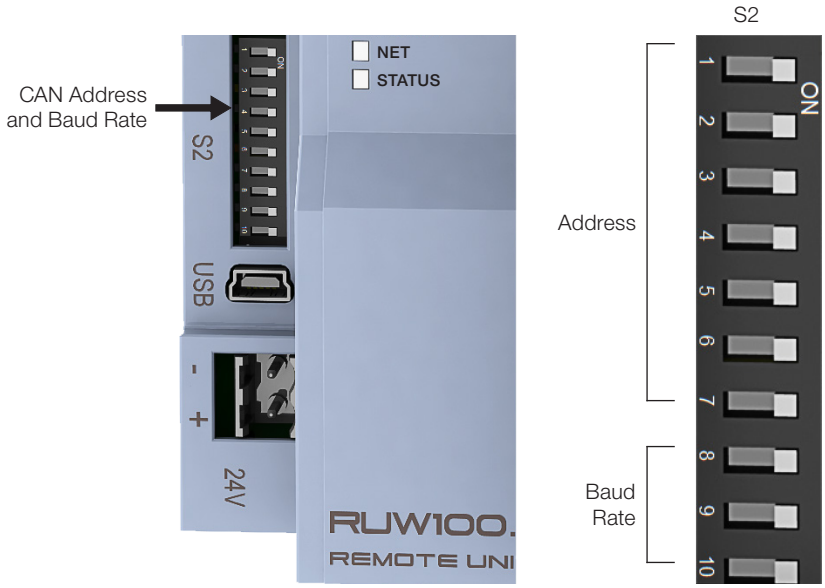


Figure 5.2: *CAN addressing*

The CAN network address is defined by switches 1 through 7, where 1 represents the least significant bit and 7 the most significant bit.

The address ranges from 0 to 127, as shown in the table below:

Switches							CAN Address
1	2	3	4	5	6	7	
OFF	OFF	OFF	OFF	OFF	OFF	OFF	0
ON	OFF	OFF	OFF	OFF	OFF	OFF	1
OFF	**ON**	OFF	OFF	OFF	OFF	OFF	2
ON	**ON**	OFF	OFF	OFF	OFF	OFF	3
OFF	OFF	**ON**	OFF	OFF	OFF	OFF	4
ON	OFF	**ON**	OFF	OFF	OFF	OFF	5
OFF	**ON**	**ON**	OFF	OFF	OFF	OFF	6...
ON	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**	...127

The CAN baud rate is defined by switches 8, 9 and 10, as shown in the table:

Switches			CAN Baud Rate
8	9	10	
OFF	OFF	OFF	1M
ON	OFF	OFF	800k
OFF	**ON**	OFF	500k
ON	**ON**	OFF	250k
OFF	OFF	**ON**	125k
ON	OFF	**ON**	100k
OFF	**ON**	**ON**	50k
ON	**ON**	**ON**	20k

For further details, refer to the CANopen manual available on **www.weg.net**.

6 RS485 COMMUNICATION INTERFACE

Insulated, multipoint serial interface intended for network communication. It operates only as a network slave with Modbus RTU protocol.

The 5-way plug-in connector to connect the Modbus network has the following pinout:

Pin	Name	Function
1	COM	Common of RS485
2	B (+)	Communication signal B (+)
3	A (-)	Communication signal A (-)
4	NC	Not connected
5	SHIELD	Cable shield

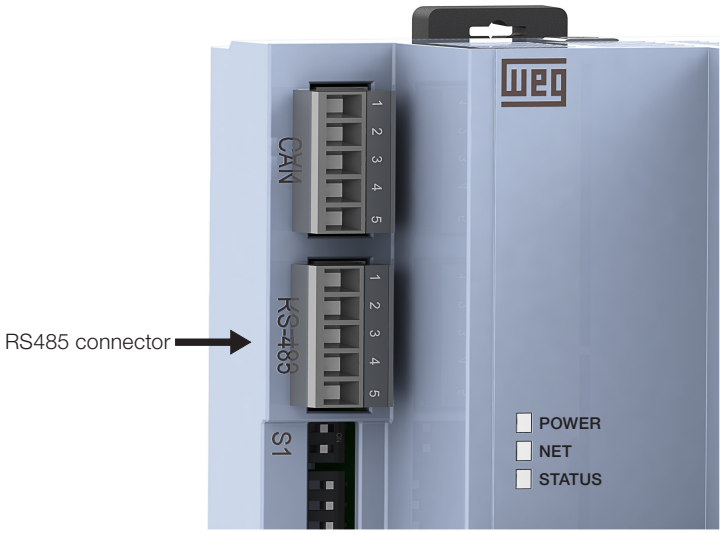


Figure 6.1: *RS485 connector*

The RS485 serial communication has configuration of the address, baud rate and bytes through the set of DIP switches S2, being limited to address 127 when using this means. Optionally, the configuration can also be done through parameters P0623, P0624, P0625, P0626 and P0627 using the WPS programming software and the USB port or the CAN network. For the RS485 configuration to be via a parameter, P0625 must receive value 1, causing the switch value to be ignored.

Configuration via DIP switches is done as Figure 6.2 on page 6-1:

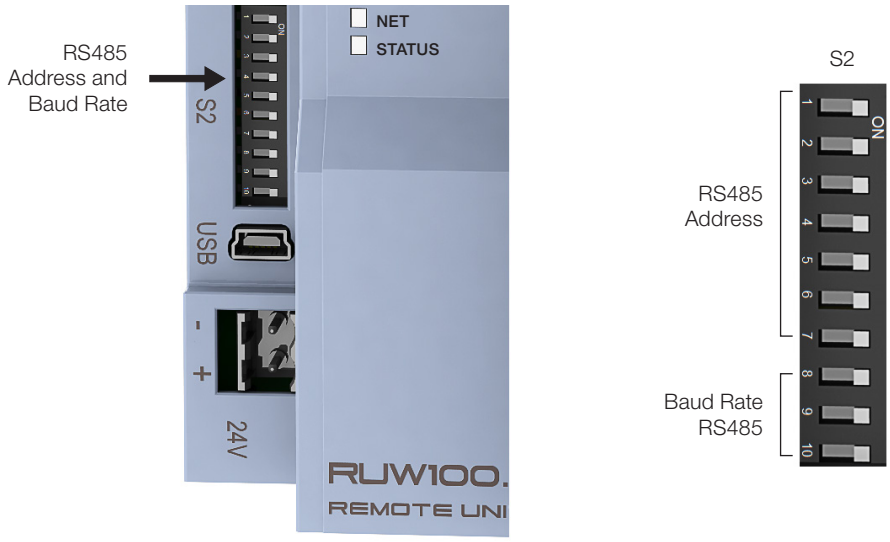


Figure 6.2: *RS485 addressing*

The network address is defined by switches 1 through 7, where 1 represents the least significant bit and 7 the most significant bit.

The address ranges from 0 to 127, as shown in the table below:

Switches							RS485 Address
1	2	3	4	5	6	7	
OFF	OFF	OFF	OFF	OFF	OFF	OFF	0
ON	OFF	OFF	OFF	OFF	OFF	OFF	1
OFF	**ON**	OFF	OFF	OFF	OFF	OFF	2
ON	**ON**	OFF	OFF	OFF	OFF	OFF	3
OFF	OFF	**ON**	OFF	OFF	OFF	OFF	4
ON	OFF	**ON**	OFF	OFF	OFF	OFF	5
OFF	**ON**	**ON**	OFF	OFF	OFF	OFF	6...
ON	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**	...127

The RS485 configuration of the bytes and baud rate are defined by switches 8, 9 and 10, as shown in the table:

Switches			RS485 Baud Rate
8	9	10	
OFF	OFF	OFF	9600 kbps Without parity, 2 stop bits
ON	OFF	OFF	19200 kbps Without parity, 2 stop bits
OFF	**ON**	OFF	38400 kbps Without parity, 2 stop bits
ON	**ON**	OFF	57600 kbps Without parity, 2 stop bits
OFF	OFF	**ON**	76800 kbps Without parity, 2 stop bits
ON	OFF	**ON**	9600 kbps Even parity, 1 stop bit
OFF	**ON**	**ON**	19200 kbps Even parity, 1 stop bit
ON	**ON**	**ON**	38400 kbps Even parity, 1 stop bit

Termination resistors can be added to the RS485 network by setting switch S1 to ON.

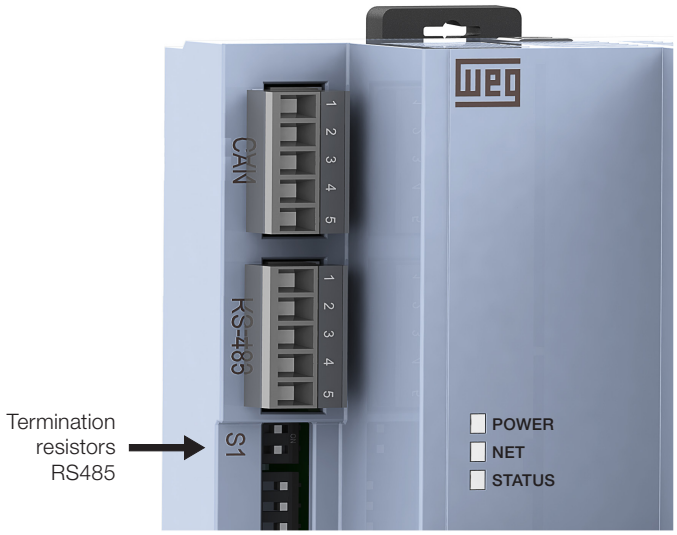


Figure 6.3: *RS485 termination resistor*

7 USB INTERFACE

Insulated, multipoint serial interface intended for network communication. It operates only as a network slave with Modbus RTU protocol.

The RUW100 has a USB port that allows the remote unit to work as a device (slave) in USB communication. This port is available for communication of the remote unit with a personal computer and allows the reading/writing of parameters and download/monitoring of the user's settings. In order to do so, WEG provides the WPS software (via download on the company's website) suitable to be used in a personal computer.

As it is in a non-isolated interface, it must not be used to operate the remote unit; it must only be used for configuration at its start-up.

Shielded Mini-USB type-B cables must be used for connection to the RUW. Cables without shield may cause communication errors.

ATTENTION!
The RUW100 and the computer must be on the same ground potential. It is recommended the use of laptop computers instead of desktops.

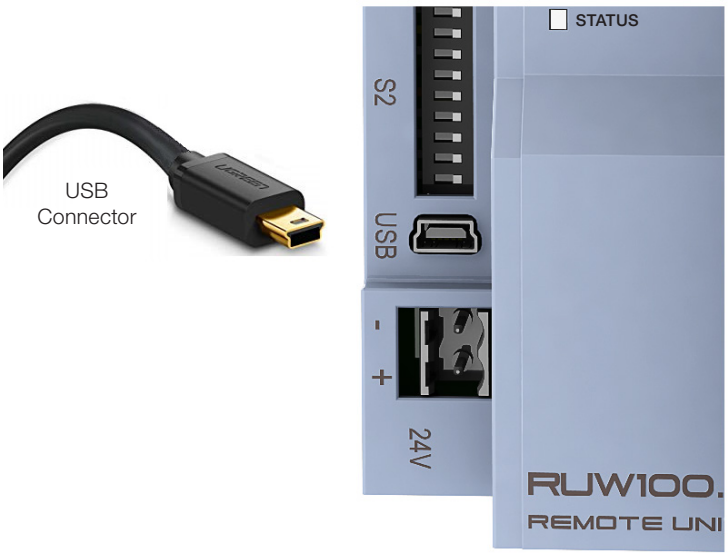


Figure 7.1: *USB Connector*

8 LEDS

8.1 POWER LED

Red LED that indicates that the RUW is energized.

8.2 LED NET

This LED by default indicates the status of the CAN communication network. Through parameter 628, it can be changed to indicate the status of the RS485.

For details on the operation, refer to the CANopen or Modbus RTU manual according to the desired configuration.

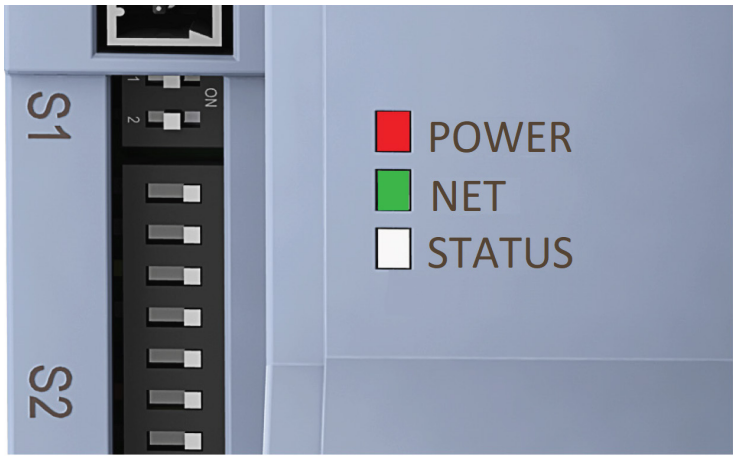


Figure 8.1: *LED POWER, NET and STATUS*

8.3 STATUS LED

It indicates the Ladder program and the remote status.

- Off: program STOPPED or no program.
- On: program RUNNING.
- Blinking every 50 ms: remote in FAULT; check P0100.

8.4 DIGITAL INPUT AND OUTPUT LED

8.4.1 Digital Output LED

LEDs O01 to O08 represent, respectively, outputs DO1 to DO8.

In the RUW100, the LEDs of the digital outputs light RED whenever the digital output is active, see Figure 9.1 on page 9-1.

8.4.2 Digital Input LED

LEDs I01 to I24 represent, respectively, inputs DI1 to DI16.

The LEDs of the digital inputs are bicolor. They light RED if the digital input is activated through the positive of the power supply, and the negative connected to the common of the inputs (PNP). They light GREEN if the positive of the power supply is connected to the common of the inputs, and the negative of the power supply connected to the respective input (NPN), see Figure 10.1 on page 10-1.

9 DIGITAL OUTPUTS

9.1 RUW100.1

The RUW100.0 has 8 own isolated and protected digital outputs. The digital output circuit must be powered externally by a 24 Vdc power supply connected to pins 1 (V+) and 2 (COM) of the I/O connector, as shown in Figure 9.1 on page 9-1.

The outputs are PNP (activate the load connected to the negative of the power supply) and can supply a current of up to 500 mA each.

For that connector, use AWG 30-16 cables.

The table below displays the name and function of each of the Digital Output connector pins:

Pin	Name	Function
1	V+	Positive of the digital output power supply
2	COM	Negative or common of the digital outputs
3	DO1	Digital output 1
4	DO2	Digital output 2
5	DO3	Digital output 3
6	DO4	Digital output 4
7	DO5	Digital output 5
8	DO6	Digital output 6
9	DO7	Digital output 7
10	DO8	Digital output 8

The example of Figure 9.1 on page 9-1 shows eight loads connected to output DO1 to DO8 which, when activated, apply V+ to the loads and indicate through the respective red LED. In this case, only outputs DO1, DO3 and DO4 are activated.

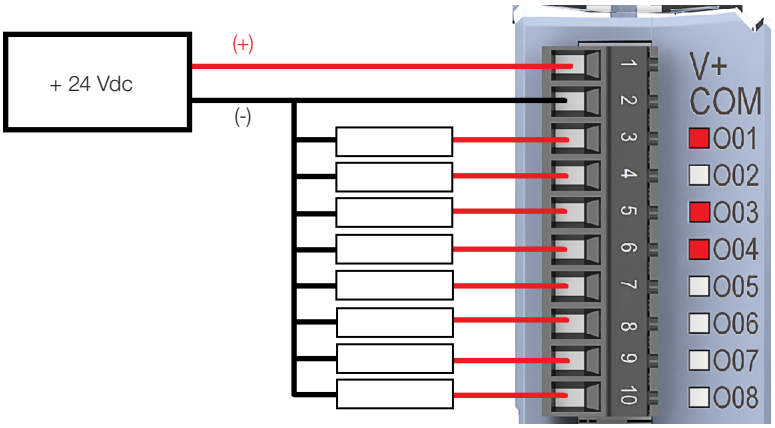


Figure 9.1: *RUW100 digital outputs*

9.2 RUW100.2

The RUW100.2 has 10 bidirectional, transistor, isolated, digital outputs with 24 Vdc rated operational voltage. An external power supply must be used to feed the load. Each digital output has a current capacity of 500 mA.

The table below contains the name and function of each pin of the Digital Output connectors.

Pin	Name	Function
1	COM	Common of digital outputs 1 to 5
2	DO1	Digital output 1
3	DO2	Digital output 2
4	DO3	Digital output 3
5	DO4	Digital output 4
6	DO5	Digital output 5
7	DO6	Digital output 6
8	DO7	Digital output 7
9	DO8	Digital output 8
10	DO9	Digital output 9
11	O10	Digital output 10
12	COM	Common of digital outputs 6 to 10

Figure 9.2 on page 9-2 below shows 10 loads connected to the RUW100.2. Loads L1 to L5 are powered by +24 V and receive the negative from the power supply when the digital output is enabled. Loads L6 to L10 receive +24 V when the digital output is enabled.

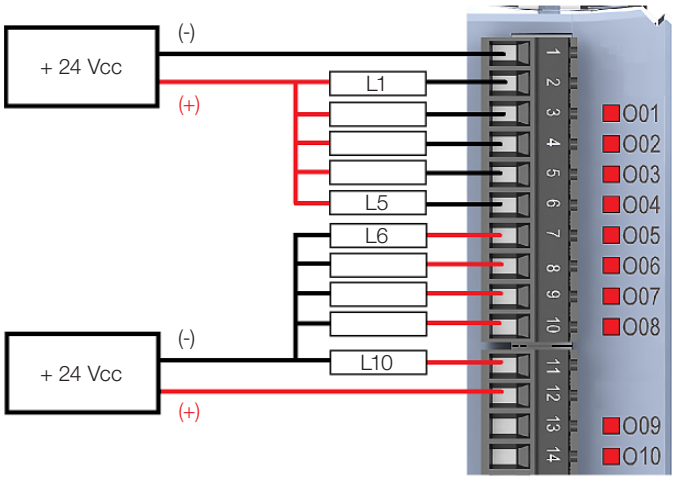


Figure 9.2: *RUW100.20 Digital outputs*

10 DIGITAL INPUTS

10.1 RUW100.1

The RUW100.1 has 16 isolated digital inputs that must be excited by an external 24 Vdc power supply. The inputs are bidirectional, which means the input common can be connected to either the negative or the Vdc of the power supply.

Two common pins are available, one for DI1 to DI8, and the other for DI9 to DI16, thus allowing a group to be connected to V+ and the other to the GND. This feature gives more flexibility to the project, since it allows both PNP and NPN contacts of a device to be connected to the RUW100.1 inputs.

The input activation levels are 10 to 28.8 Vdc for high level and below 3 Vdc for low level.

For those connectors, use AWG 30-16 cables. The table below displays the name and function of each of the Digital Input connector pins.

Pin	Name	Function
11	NC	Not connected
12	COM	Common of the digital inputs 1 to 8
13	DI1	Digital input 1
14	DI2	Digital input 2
15	DI3	Digital input 3
16	DI4	Digital input 4
17	DI5	Digital input 5
18	DI6	Digital input 6
19	DI7	Digital input 7
20	DI8	Digital input 8
21	NC	Not connected
22	COM	Common of digital inputs 9 to 16
23	DI9	Digital input 9
24	DI10	Digital input 10
25	DI11	Digital input 11
26	DI12	Digital input 12
27	DI13	Digital input 13
28	DI14	Digital input 14
29	DI15	Digital input 15
30	DI16	Digital input 16

The example of Figure 10.1 on page 10-1 shows Digital Inputs DI1, DI3 and DI5 activated through the positive terminal of the power supply (PNP), and Digital Inputs DI9, DI13 and DI16 through the negative of the power supply (NPN).

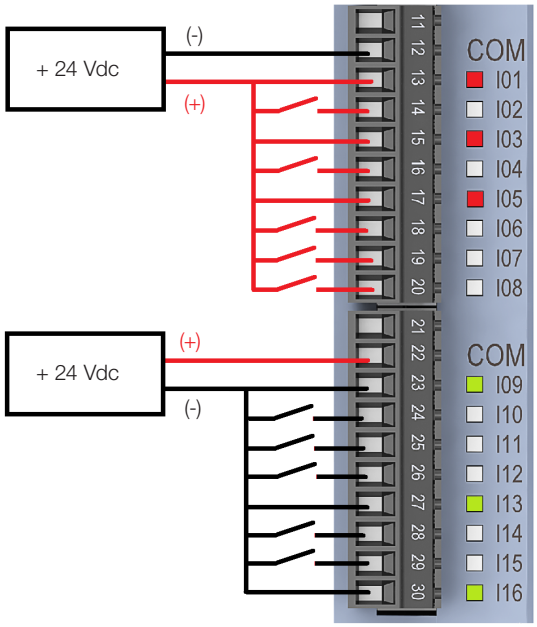


Figure 10.1: *RUW100.1 digital inputs*

10.2 RUW100.2

The RUW100.2 has 14 isolated digital inputs that must be excited by an external 24 Vdc power supply. The inputs are bidirectional, which means the common of the inputs can be connected to either the GND or the Vdc of the power supply.

Two common pins are available for DI1 to DI7, and two other pins for DI8 to DI14, thus allowing a group to be connected to V+ and the other to GND, providing more flexibility to the project, as it allows both PNP and NPN contacts of a device to be connected to the RUW100.20 inputs.

The input activation levels are 10 to 28.8 Vdc for high level and below 3 Vdc for low level. The table below contains the name and function of each pin of the Digital Output connectors.

Pino	Name	Function
13	I01	Digital input 1
14	I02	Digital input 2
15	I03	Digital input 3
16	I04	Digital input 4
17	I05	Digital input 5
18	I06	Digital input 6
19	I07	Digital input 7
20	COM	Common of digital inputs 1 to 7

Pin	Name	Function
21	COM	Common of digital inputs 1 to 7
22	I08	Digital input 8
23	I09	Digital input 9
24	I10	Digital input 10
25	I11	Digital input 11
26	I12	Digital input 12
27	I13	Digital input 13
28	I14	Digital input 14
29	COM	Common of digital inputs 8 to 14
30	COM	Common of digital inputs 8 to 14

The example of Figure 10.2 on page 10-2 shows Digital Inputs DI1, DI3 and DI5 activated through the positive terminal of the power supply (PNP), and Digital Inputs DI9, DI13 and DI16 through the negative of the power supply (NPN).

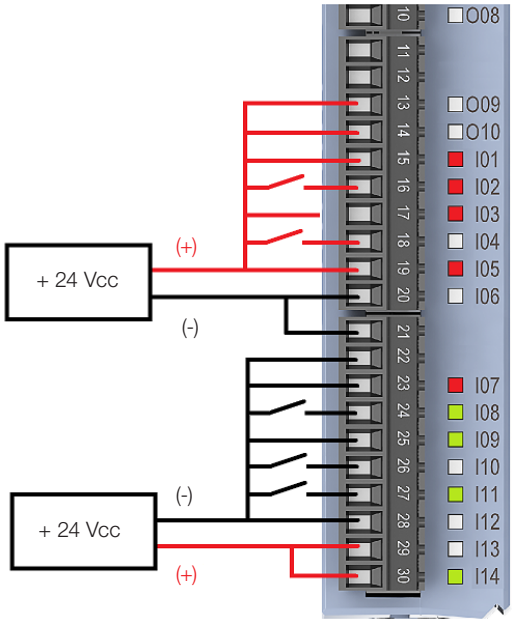


Figure 10.2: *RUW100.2 Digital inputs*

11 EXPANSION BOARDS

The RUW100 has a bus that allows the connection of up to 8 expansion boards, as shown in the image:

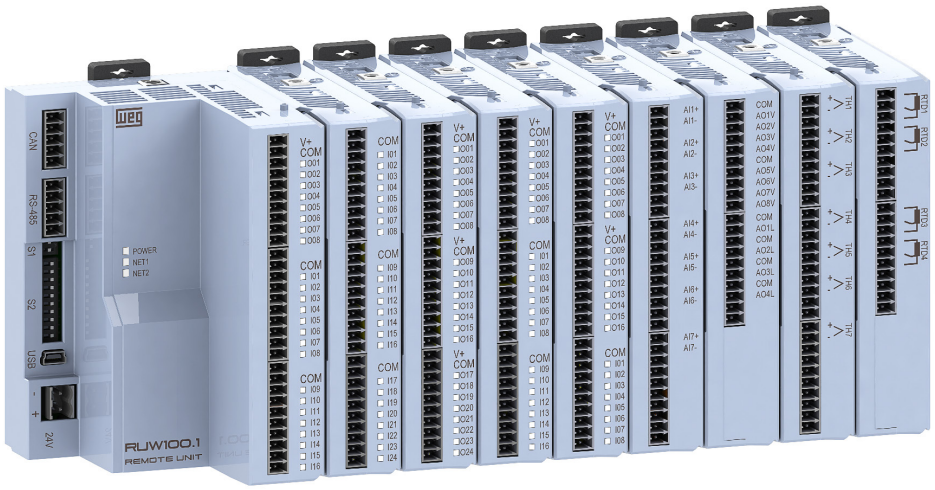


Figure 11.1: *RUW100 with eight expansions*

The expansion boards are incorporated to the RUW100 in a simple and fast way, using the "Plug and Play" concept by the user. When the RUW100 is powered up, the electronic circuit identifies the number of connected expansions, the model and the firmware version of each one. They also receive an address according to the position of each one, so that it is possible to access them through the communication bus. Some parameters indicate the information below:

- P0400 indicates the number of connected expansions.
- P0401 indicates the model of the RUW100.
- P0402 to P0409 indicates the model of each accessory connected.
- P0500 RUW100 indicates the firmware version.
- P0501 to P0508 indicates the firmware version for each expansion.

ATTENTION!
Accessories must be installed or removed with the RUW100 de-energized to avoid burning components and also to allow them to be identified.

11.1 AVAILABLE MODELS

The table below presents a summary of each expansion available for the RUW100. For further details, see the manual for each accessory.

Model	Characteristic
MOD1.00 - 24DIs	24 bidirectional digital inputs
MOD1.10 - 24DOs	24 isolated digital outputs 24 V/500 mA
MOD1.20 - 16DO/8DI	16 isolated 24 V/500 mA digital outputs and 8 bidirectional digital inputs
MOD1.30 - 08DO/16DI	8 isolated 24 V/500 mA digital outputs and 16 bidirectional digital inputs
MOD2.00 - 7AI	7 voltage or current analog inputs
MOD3.00 - 8AO	8 analog outputs with voltage 0 to 10 V and 4 with current 0 to 20 mA
MOD4.00 - 7TH	7 thermocouple inputs type J, K and T
MOD5.00 - 4RTD	4 PT100 and PT1000 thermistor inputs
MOD6.00 - 2SG	2 load cell inputs
MOD7.00 - 6RE	6 relay outputs

11.2 ACCESSORY LIMIT

The RUW100 allows coupling up to 8 expansion modules. However, there is a 300 mA limitation on the +/-15 V supply that powers part of the circuit of some expansions.

To find out how many accessories can be coupled, use the table below with the current consumption values of each module :

Model	Consumption
MOD1	0 mA
MOD2	40 mA
MOD3	150 mA
MOD4	0 mA
MOD5	0 mA
MOD6	30 mA
MOD7	50 mA

11.2.1 Configuration and Consumption Examples

Ex1: 1 x MOD3 + 1 x MOD2 + 4 x MOD1 = 1 x 150 + 1 x 40 + 4 x 0 = 190 mA (OK).

Ex2: 2 x MOD3 + 4 x MOD1 + 2 x MOD5 = 2 x 150 + 4 x 0 + 2 x 0 = 300 mA (OK).

Ex3: 2 x MOD3 + 4 x MOD1 + 1 x MOD7 = 2 x 150 + 3 x 0 + 1 x 50 = 350 mA (Current limit exceeded).

Ex4: 1 x MOD3 + 4 x MOD1 + 4 x MOD5 = 1 x 150 + 4 x 0 + 4 x 0 = 150 mA (Accessory limit exceeded).

NOTE!
The sum of consumption cannot exceed 300 mA, and the maximum number of accessories is 8. An error will be generated in the programming software if this limit is exceeded.

12 TECHNICAL DATA

Power Supply:

- Input voltage: 24.0 V.
- Minimum input voltage: 20.4 V.
- Maximum input voltage: 28.8 V.
- Maximum input current 1 A.

Operating Temperature:

- 0 °C to 45 °C.
- Air relative humidity: 5 % to 90 % non-condensing.

Degree of Protection:

- IP20.

Pollution Degree:

- 2 (according to EN50178 and UL508C), with non-conductive pollution.

Altitude:

- 1000 m (3,300 ft). Above 1000 m to 4000 m (3,300 ft to 13,200 ft), the output current must be derated by 1 % for every 100 m (328 ft) above 1000 m (3,300 ft).
- Environment with pollution degree 2 (as per EN50178 and UL508C).

RUW100.1 Digital Outputs:

- PNP outputs.
- Recommended voltage V+: 24 V.
- Maximum voltage V+: 28.8 V.
- Maximum current of each output: 500 mA.

RUW100.2 Digital Outputs:

- Bidirectional transistor outputs.
- Recommended voltage V+: 24 V.
- Maximum voltage V+: 28.8 V.
- Maximum current of each output: 500 mA.

Digital Inputs:

- Bidirectional Inputs.
- Maximum input voltage: 28.8 V.
- High level: Vin ≥ 10 V.
- Low level: Vin ≤ 3 V.
- Consumption at 24 V: 10 mA.
- Insulation voltage: 500 V.

Processor:

- Processor: Arm® Cortex®-M4 32-bit.
- Speed: 72 MHz.

RUW100 Memory:

- Ladder: 16368 Bytes.
- Source Code: 65535 Bytes.
- Variable map: 16368 Bytes.
- Volatile Variables: 4096 Bytes.
- Retentive Variables: 256 Bytes.
- Total Memory: 102623 Bytes.

Program with 1000 instructions (500 contacts + 500 coils):

- Ladder Memory Used: 8280 Bytes (~50 %).
- Total Scan Cycle: 2.35 ms.
- Scan per program kByte: 0.29 ms.