Versatronik® 522 & 522D OT

Communication Gateway
Modbus RTU/RS485

Document Applicable to:
Wall Mount
Versatronik 522 OT/Modbus P/N 704054
DIN Rail Mount
Versatronik 522 OT/Modbus P/N 704077

Applicable Controls
Vitodens 100, WB1A
Vitodens 100, WB1B

KWE
Technologies
Group

Technical, Installation and Configuration Information

Cautionary Statement

The information presented in this document is only to be used by those familiar with its application and use.

Communication (vertical text, left margin)

C **US** **LR 102874**

IMPORTANT

Read and save these instructions for future reference

About these instructions

⚠️ Take note of all symbols and notations intended to draw attention to potential hazards or important product information. These include "WARNING", "CAUTION" and "IMPORTANT". See below.

⚠️ **WARNING**

Indicates an imminently hazardous situation which, if not avoided, could result in death, serious injury or substantial product/property damage.

→ *Warnings draw your attention to the presence of potential hazards or important product information.*

⚠️ **CAUTION**

Indicates an imminently hazardous situation which, if not avoided, may result in minor injury or product/property damage.

→ *Cautions draw your attention to the presence of potential hazards or important product information*

CAUTION

Static sensitive components may be damaged by improper handling or work within the control. Ensure all possible measures are taken to eliminate build-up of static electricity.

IMPORTANT

→ *Helpful hints for installation, operation or maintenance which pertains to the product.*

Trademark Information

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www.viessmann.us

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For more information, please visit:
www.opentherm.eu

Codes
The installation of this unit must be in accordance with local codes.

All electrical wiring is to be done in accordance with the latest edition of CSA C22,1 Part 1 and/ or local codes. In the U.S. use the National Electrical Code ANSI/NFPA 70.

The installing contractor must comply with the Standard of Controls and Safety Devices for Automatically fired Boilers, ANSI/ ASME CSD-1 where required by the authority having jurisdiction.

Working on the equipment
The installation, adjustment, service and maintenance of this unit must be done by a licensed professional heating contractor or persons who are qualified and experienced in the installation, service, and maintenance of similar products. There are no user serviceable parts on this control.

Power supply
Install power supply in accordance with the regulation of the authorities having jurisdiction or in absence of such requirements, in accordance with National Codes.

→ *Please carefully read this manual prior to attempting installation. Any warranty is null and void if these instructions are not followed.*

→ *The completeness and functionality of field supplied electrical controls and components must be verified by those installing the device*

⚠ WARNING

More than one live circuit. See wiring diagram in this manual. Turn off power supply to control and damper/blower before servicing. Contact with live electrical components can result in serious injury or death

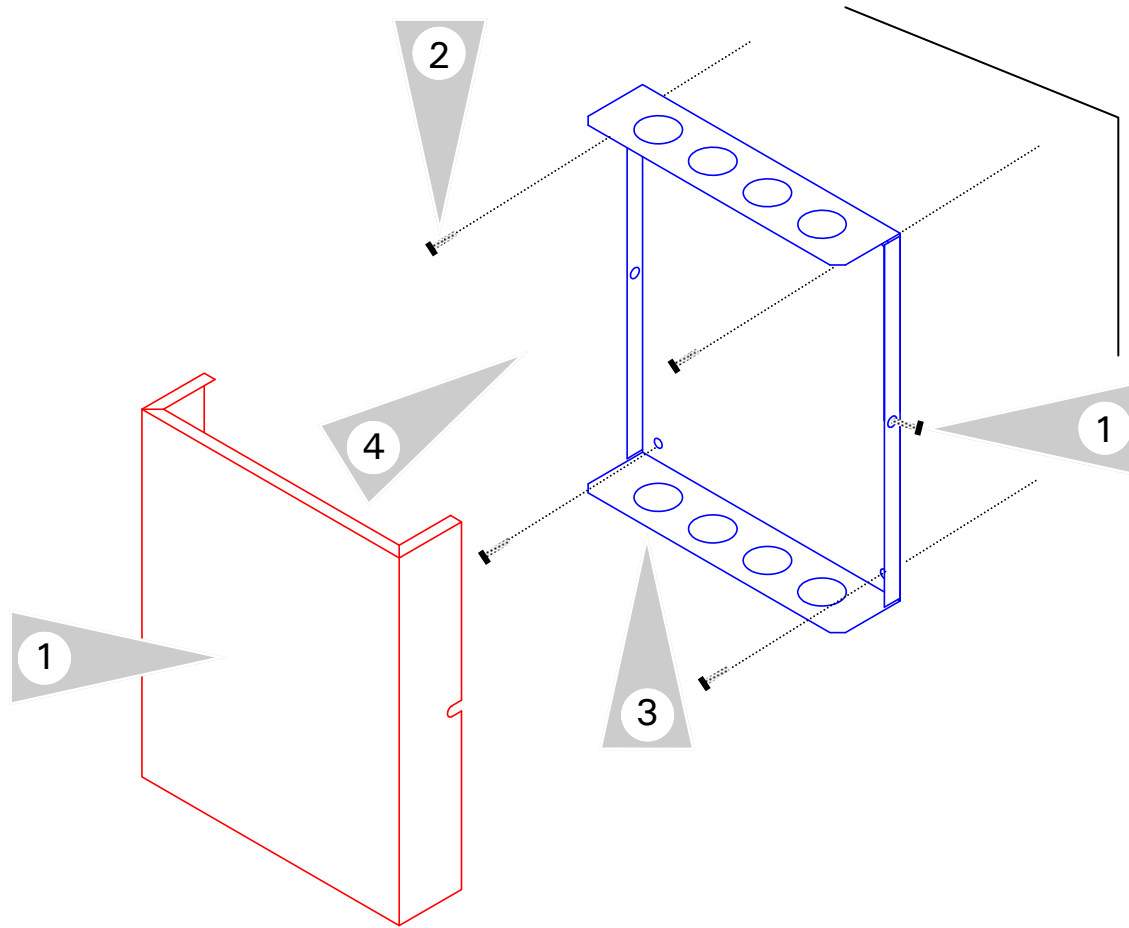# Purpose of Device and Operation

The Versatronik 522 OT gateway provides a communication translation between OT enabled boilers and Modbus enabled BMS systems.

The Versatronik gateway may be either part of a control panel or stand-alone control device.

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Installation

Mounting Versatronik Gateway—120VAC Unit

Mounting Steps

1. Mount Versatronik 522 Gateway in a convenient location near the connected boiler control. Remove cover by loosening the two screws on either side of base to release the cover.
2. Fasten base to wall using field-supplied screws/fasteners.
3. Remove knockout and installed wire strain relief or box connector. Removal of remaining knockouts is required to make further connections.
4. Once all of the 120VAC and low voltage connections are complete and verified, reinstall the cover from Step 1.
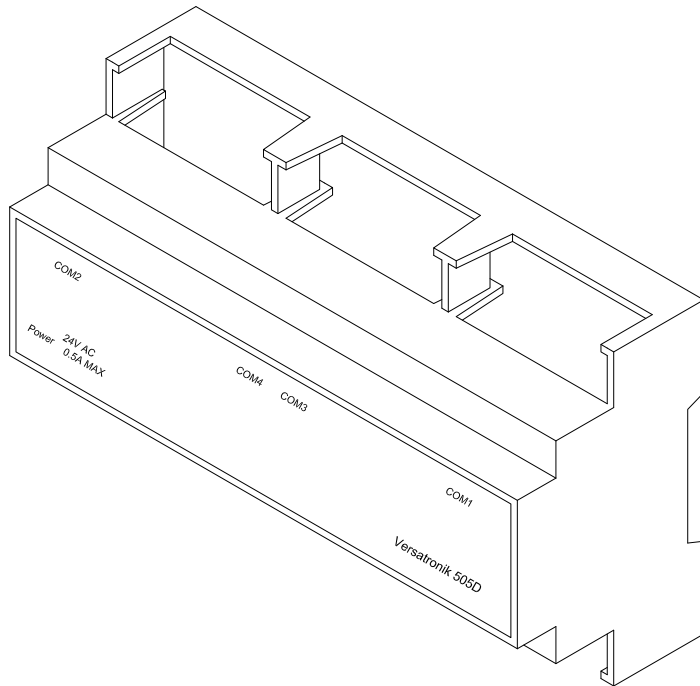
⚠️ **WARNING**

When extending wire there is the possibility of exposure to electromagnetic interference. Avoid running wires beside or near high voltage 120/240 VAC conductors. If proximity to high voltage conductors cannot be avoided, use stranded, twisted pair of shield design wire. Ensure that only one end of the shielding is grounded.

### Mounting Versatronik Gateway—24VAC DIN Rail Unit

Mounting Steps

1. Mount Versatronik 522D Gateway onto DIN rail within an enclosure in a convenient location near the boiler controls.
2. Make all the necessary connections including the field supplied 24VAC power connection.

COM2

Power   24V AC
0.5A MAX

COM4   COM3

COM1

Versatronik 505D

Connection Overview

1. BACnet IP RJ45 connection (model specific)
2. LON RJ45 connection (model specific)
3. Parallel LON BUS connection
4. OT connections terminals A and B to boiler
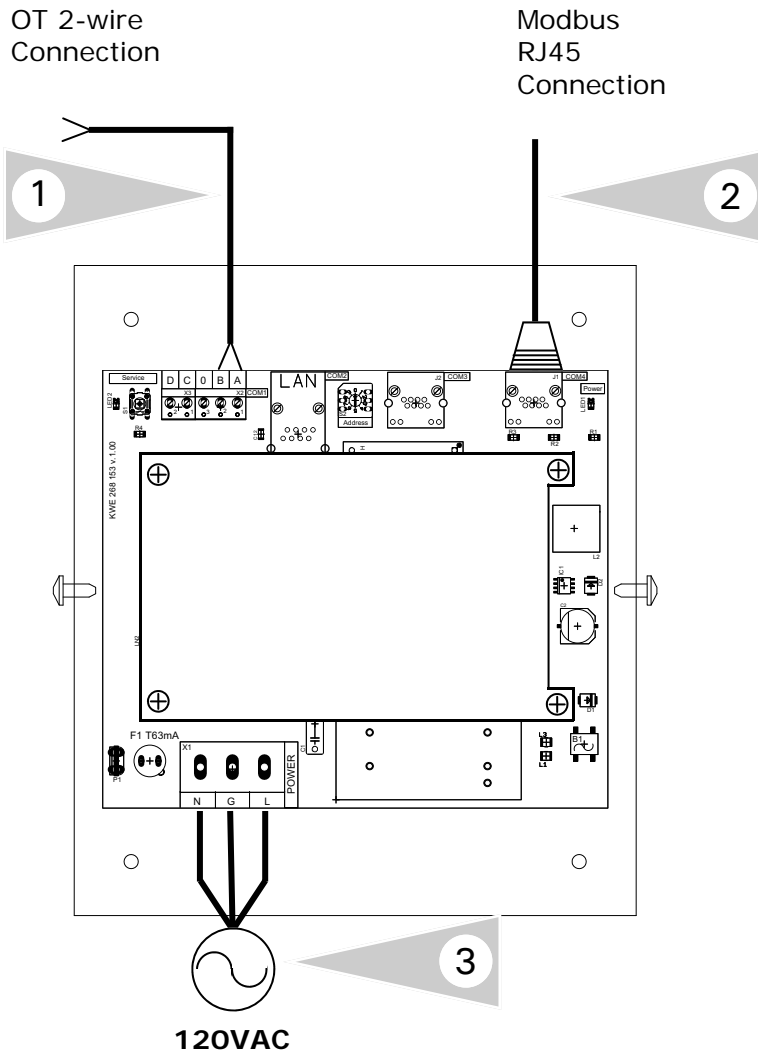5. 24VAC Power Connection
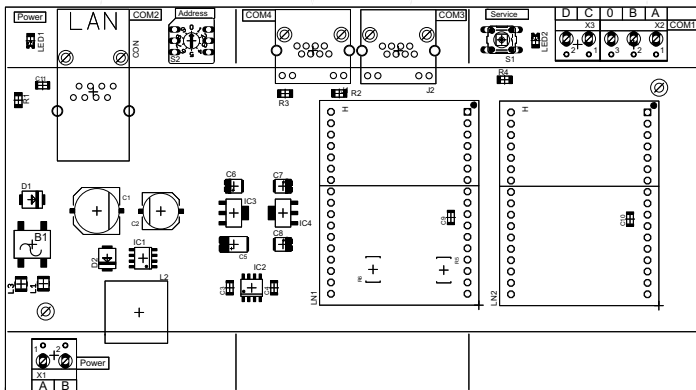
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⚠️ **WARNING**

When extending wire there is the possibility of exposure to electromagnetic interference. Avoid running wires beside or near high voltage 120/240 VAC conductors. If proximity to high voltage conductors cannot be avoided, use stranded, twisted pair of shield design wire. Ensure that only one end of the shielding is grounded.

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Connection Overview

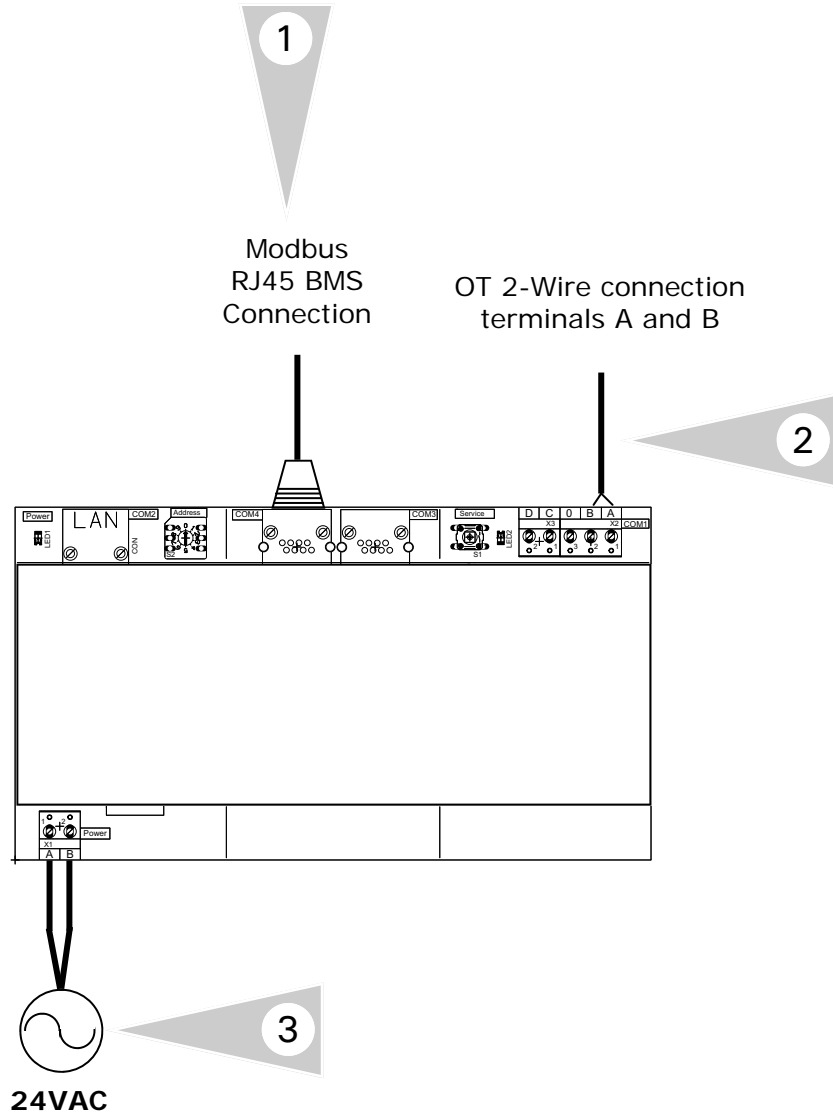1 OpenTherm 2 wire connection to OT enabled boiler. Refer to boiler manual for proper connection location.

2 Modbus RJ45 connection.

3 Plug-in power cord for 120VAC Versatronik 522 gateways.

OT 2-wire
Connection

Modbus
RJ45
Connection

120VAC

Connection Overview—24VAC

1

Modbus
RJ45 BMS
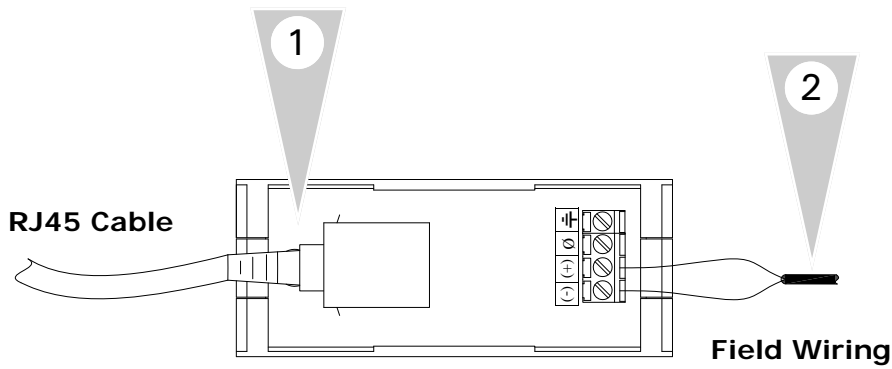Connection

OT 2-Wire connection
terminals A and B

2

Connection Overview

1 Modbus RJ45 connection.

2 Field wiring for OpenTherm connection to terminals A and B.

3 Field supplied 24VAC power supply for gateway.

3

24VAC

Connection Overview—RJ45 Adapters for Modbus Communication

RJ45 Adapter Modbus

RJ45 Cable

Field Wiring

Overview

1. A RJ45 Adapter is supplied with the Modbus version of Versatronik 522 Gateway. Utilize the supplied adapter and connection cable to interconnect the gateway and adapter.

2. Connect the field wiring to terminal X1 for the Modbus communication.

Modbus Information

Connection Settings
Use standard straight-through network cable to connect COM4 to Adapter. From adapter, use screw terminals (+ and -) to connect to RS485 Network.

(+) non-inverting
(—) inverting

Baud Rate: 9600bps
Data bits: 8
Parity: none
Stop bits: 1
Address: Controlled by rotary Address knob (0 = address 88, 1-9 = addresses 1 - 9.)

LED indicators
COM4 has two LED indicators. An orange blip means a packet is received, a green blip means a response has been sent by the gateway.

Modbus Communication

Configuration Settings
The gateway is a Modbus slave and all communication has to be initiated by a master. To set up successful communication with the gateway all connection parameters have to be set correctly to the following: 9600 8-N-1 RTU.

Mode	RTU
Baud Rate	9600bps
Data Bits/Length	8
Parity	None
Stop bits	1
Address/Device ID	88, 1-9

Trouble-Shooting

Problem: Not getting a response from the gateway device

- Ensure the connection is set to 9600 8-N-1
- Check the rotary dial switch for the device addressing and it not in between dial settings
- Ensure the communication cables match their polarity

Configuration of Gateway—Modbus RTU/RS485

Coil / Discrete Inputs (01/02)			
Address	**Value**	**Read/Write**	**Units**
00001	Control Method (0 = Temp. Set-point control, 1= Modulation Controlled)	W	^0C / ^0F
00002	Temperature Units (0 = ^0C, 1 = ^0F)	W	^0C / ^0F
00003	Boiler Enable	W	
00004	Reserved		
00005	Reserved		
00006	Reserved		
00007	Reserved		
00008	Reserved		
00009	Boiler - Fault Indication	R	0/1
00010	Boiler - CH Mode active	R	0/1
00011	Boiler – DHW Mode active	R	0/1
00012	Boiler – Flame Status	R	0/1
00013	Boiler – Cooling Status	R	0/1
00014	Boiler – CH3 Mode	R	0/1
00015	Boiler – Diagnostic indication	R	0/1
00016	Reserved	R	0/1
00017	Fault - Service Request	R	0/1
00018	Fault - Lockout - Reset	R	0/1
00019	Fault - Low water pressure	R	0/1
00020	Fault - Gas / Flame fault	R	0/1
00021	Fault - Air Pressure fault	R	0/1
00022	Fault - Water Over Temp	R	0/1
00023	Reserved	R	0/1
00024	Reserved	R	0/1

Holding / Input Registers (03/04)			
Address	**Value**	**Read/Write**	**Units**
40001	Set-point[1]	W	^0C / ^0F
40002	DHW Set-point[2]	W	^0C / ^0F
40003	Boiler Water Temperature	R	^0C / ^0F
40004	Modulation Level	R	%
40005	Return Water Temperature	R	^0C / ^0F
40006	Flue Gas Temperature	R	^0C / ^0F
40007	Boiler Heat Exchanger Temperature	R	^0C / ^0F
40008	Outdoor Temperature	R	^0C / ^0F
40009	Boiler Fan Speed	R	Hertz
40010	Water Pressure	R	mBar / PSI
40011	OEM Fault Code[3]	R	
40012	OEM Diagnostic Code[3]	R	
40013	DHW Set-point Upper Bound	R	^0C / ^0F
40014	DHW Set-Point Lower Bound	R	^0C / ^0F

Note: Availability of these Variables depends on the boiler and/ or thermostat used. Unavailable variables will be displayed as -99 in most cases.

[1] All boilers will allow for Set-point control, i.e., you provide the boiler set point temperature. Not all boilers support modulation control (ID14). Under modulation control, boiler temperature set point will be set to ID57 (Max CH Water Set-point). If not provided, it will be set to 90C. Modulation is then controlled by providing the boiler with a maximum modulation level (ID14).

[2] Not all boilers support DHW set-point (ID6, 48, 56). Gateway will automatically adjust DHW set-point to fall between the upper and lower DHW se-point bounds provided by the boiler (ID48).

[3] Reference your boiler documentation for meaning of these codes. They will likely be in Hexadecimal format. E.g. 10=0A, 15=0F, 16=10, 17=11, 255=FF

Trouble-Shooting

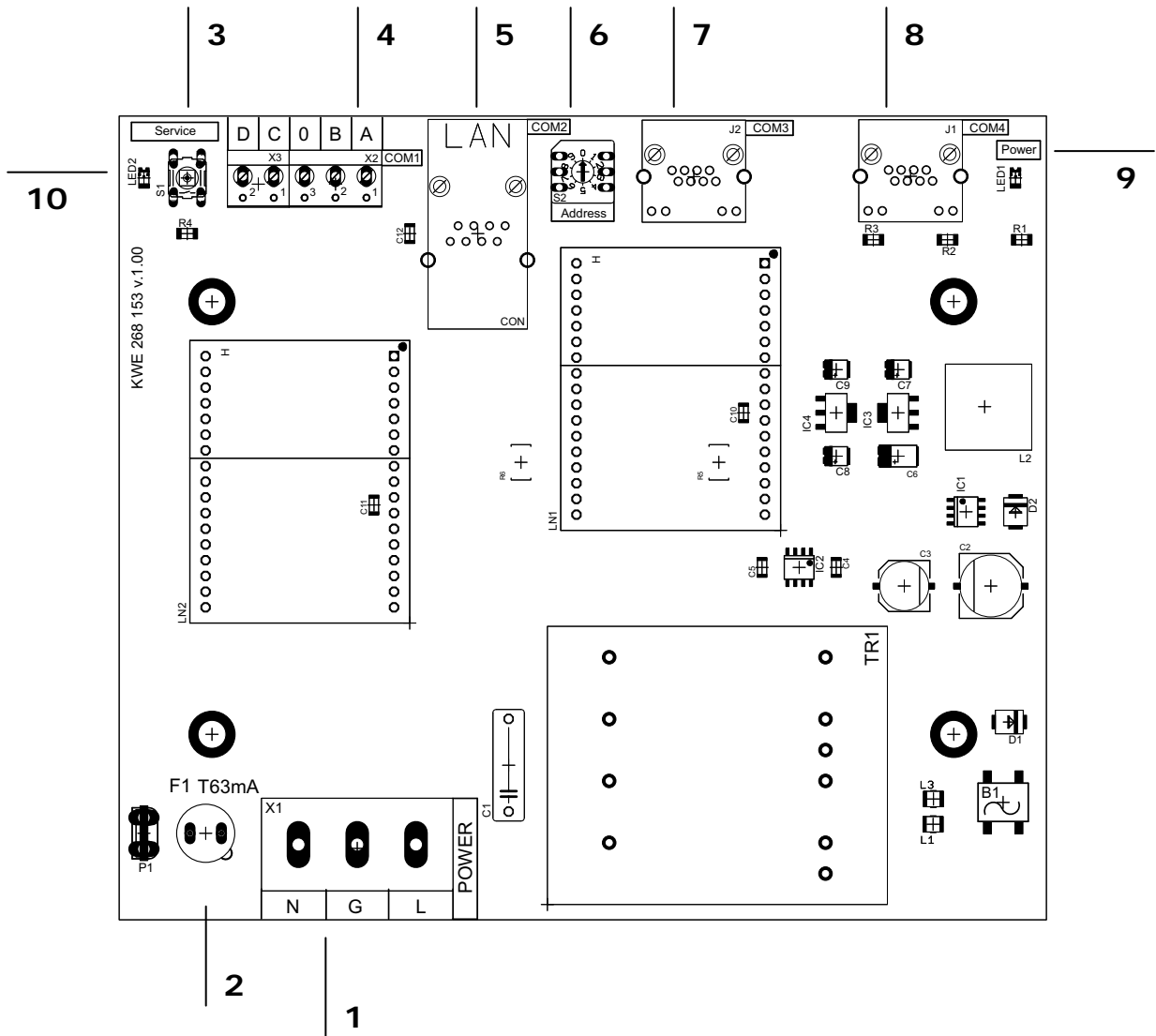**Problem: LED2 is flashing**

Control/BMS Mode

LED 1 flash per second—OK
LED 4 flash per second—No Communication

Modbus Gateway
LED indicators
COM4 has two LED indicators. An orange blip
means a packet is received, a green blip means
a response has been sent by the gateway.

Technical Information—120VAC

PCB Identifiers

|	
1	120VAC Power Supply Connections
2	Fuse
3	Service Button
4	OT Connections to boiler (terminals A and B)
5	RJ45 Connection to BMS BACnet
6	Rotary Dial not used
7	Parallel connection for LON Communication
8	RJ45 Connection to LON/Modbus via adapter
9	Power LED indicator
10	OT Indicator LED

Specifications

Voltage Requirements	120VAC
Fuse Rating	63mA Time Delay
Power	4VA
Communication Connections	Supplied cable between devices

⚠ CAUTION

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Technical Information
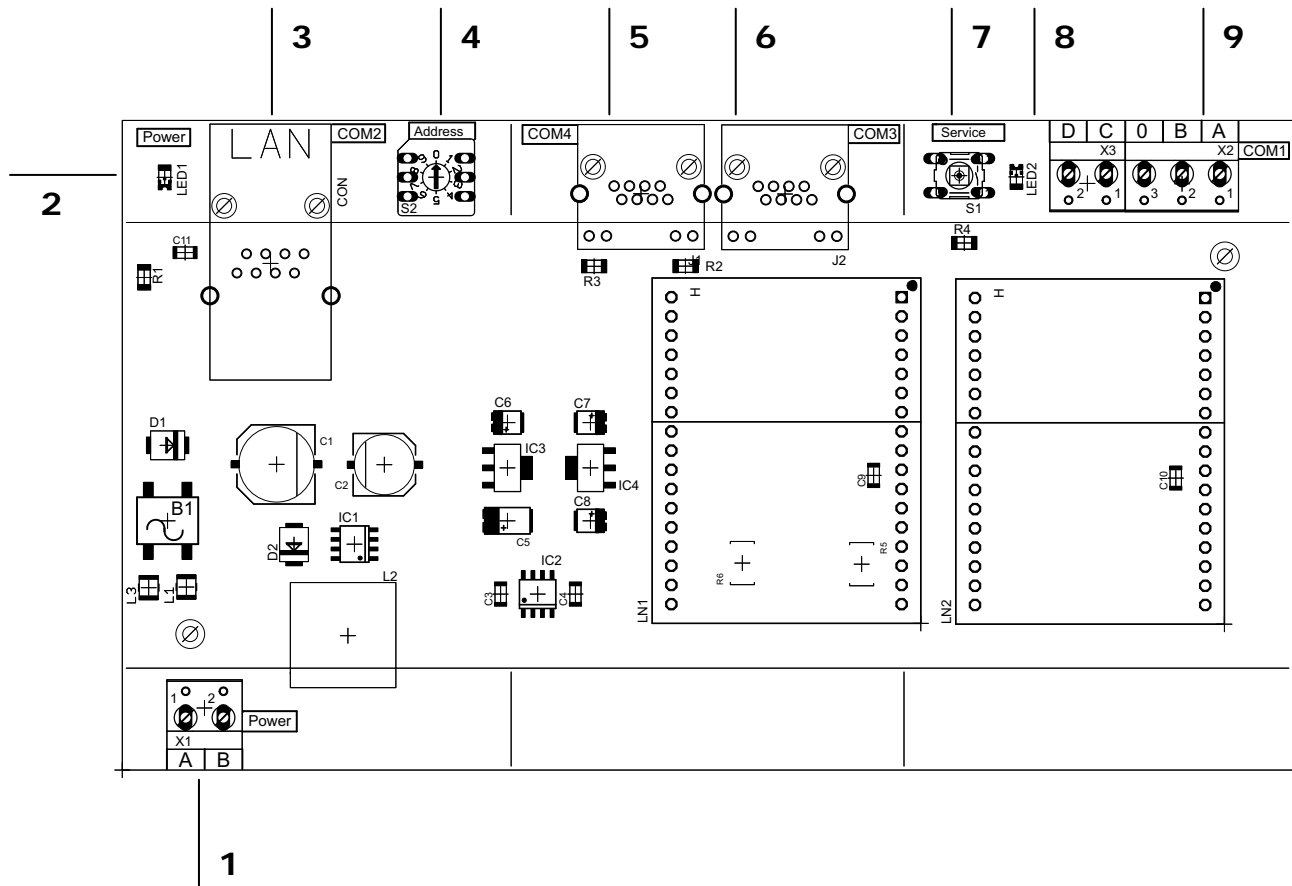
PCB Identifiers

1	24VAC Power Supply Connections
2	Power LED indicator
3	BACnet RJ45 BMS Connection
4	N/A
5	RJ45 LON/Modbus via RJ45 adapter to BMS
6	Parallel LON connection
7	Service button
8	OT Indicator LED
9	OT connection to boiler (terminals A and B)

Specifications

Voltage Requirements	24VAC
Fuse Rating	N/A
Power	4VA
Communication Connections	Supplied cable between devices

⚠ CAUTION

Static sensitive components may be damaged by improper handling or work within the control. Ensure all possible measures are taken to eliminate build-up of static electricity.

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Notes:

Notes:

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