Communication

Versatronik® 521 & 521D OT

Communication Gateway
LON

Document Applicable to:
Wall Mount
Versatronik 521 OT/LON 704052
DIN Rail Mount
Versatronik 521D OT/LON 704072

Applicable Controls
Vitodens 100, WB1A
Vitodens 100, WB1B

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.

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.*

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Important Regulatory and Installation Requirements

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

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

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

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.

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

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.

Purpose of Device and Operation

The Versatronik 521 OT gateway provides a communication translation between OT enabled boilers, room thermostat controls, LON enabled BMS systems.

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

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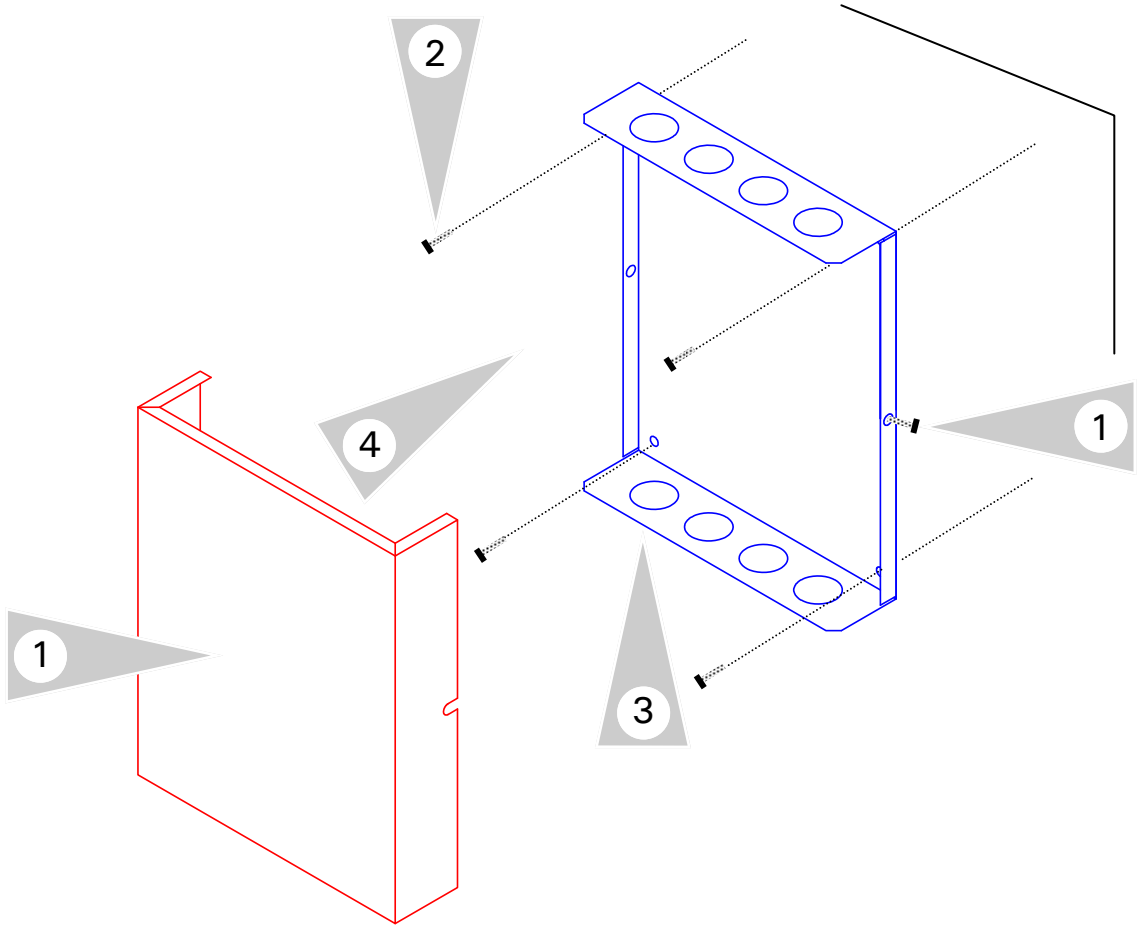
Installation

Mounting Versatronik Gateway—120VAC Unit



Mounting Steps

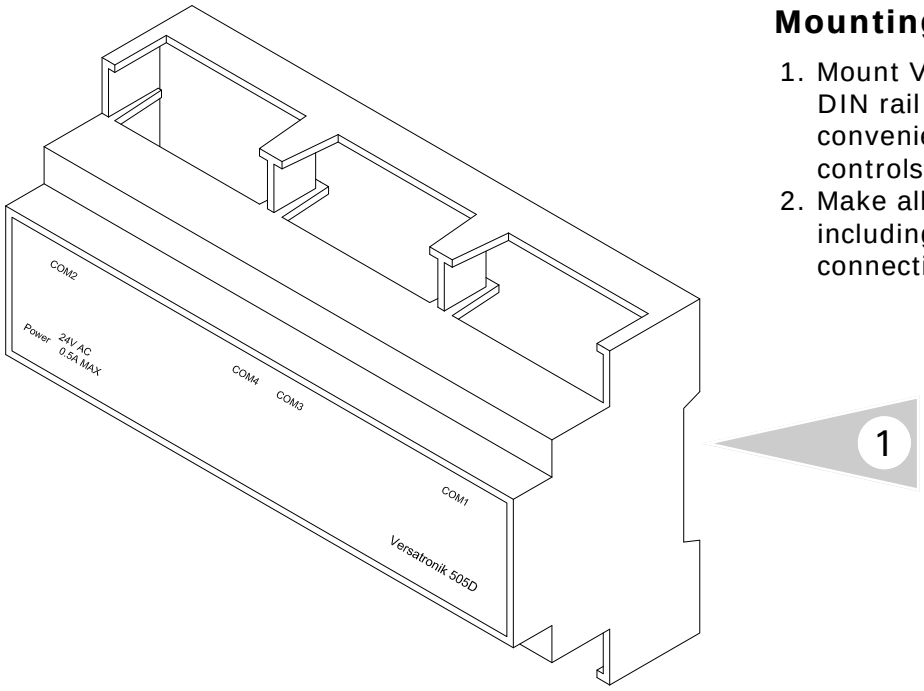
1. Mount Versatronik 521 Gateway in a convenient location near the connected boiler control. Remove cover by loosening the two screws on either side of base to release the cover.
2. Fasten base to wall using field-supplied screws/fasteners.
3. Remove knockout and installed wire strain relief or box connector. 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.

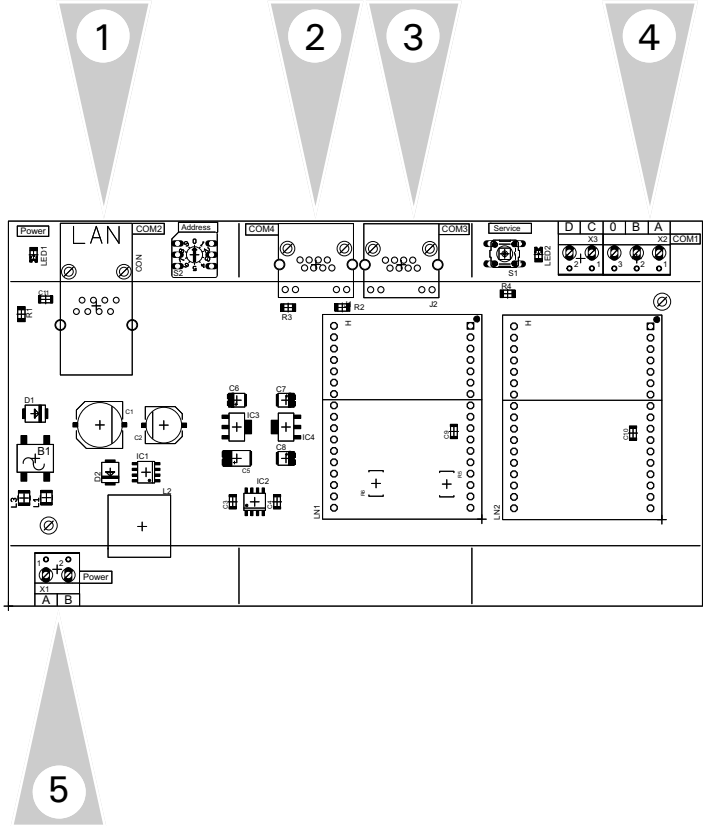
Installation

Mounting Versatronik Gateway—24VAC DIN Rail Unit



Mounting Steps

1. Mount Versatronik 521D 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.



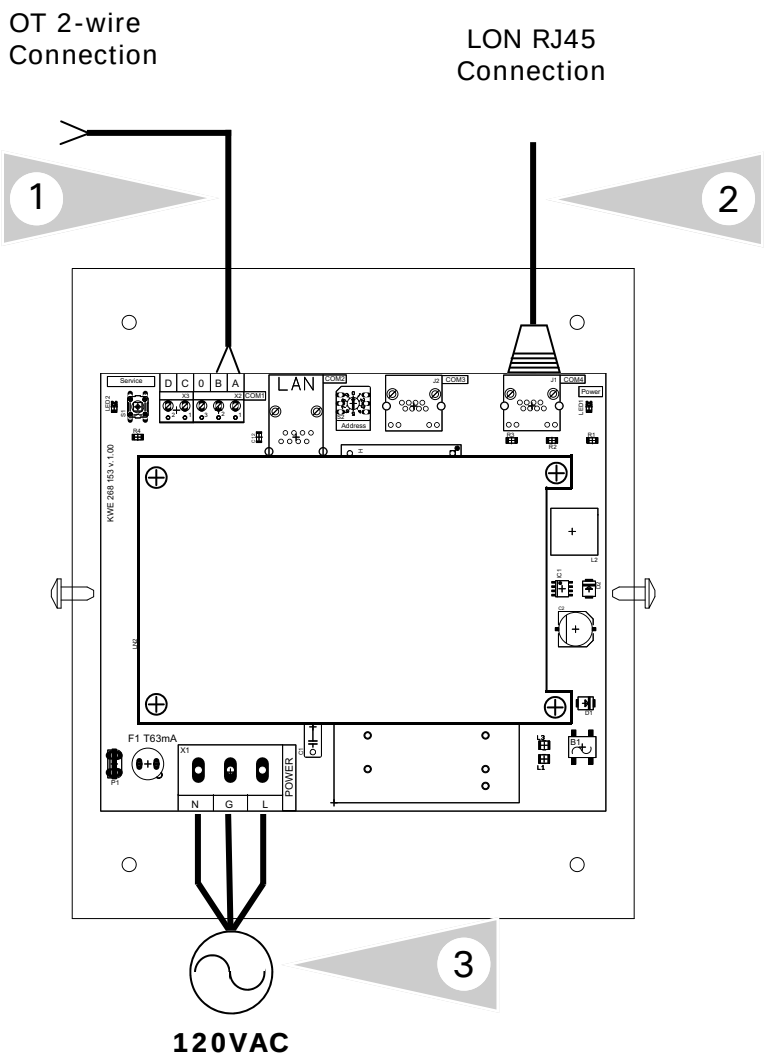
Connection Overview

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

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.

Connection Overview—120VAC



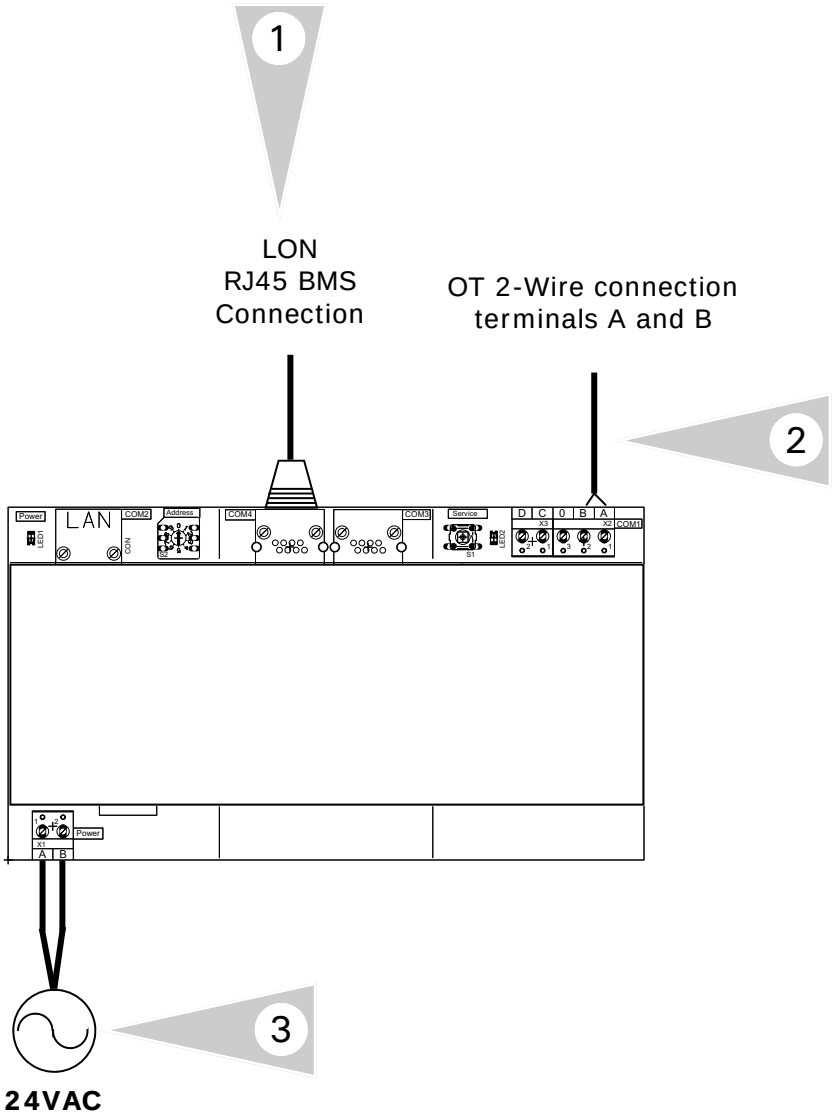
Connection Overview

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

2 LON RJ45 connection.

3 Plug-in power cord for 120VAC Versatronik 521 gateways.

Connection Overview—24VAC



Connection Overview

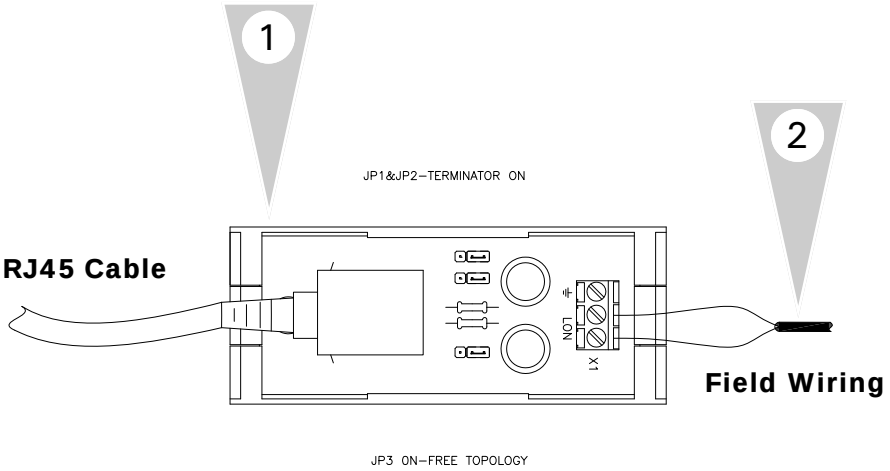
1 LON RJ45 connection.

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

3 Field supplied 24VAC power supply for gateway.

Connection Overview—RJ45 Adapters LON

RJ45LON Adapter



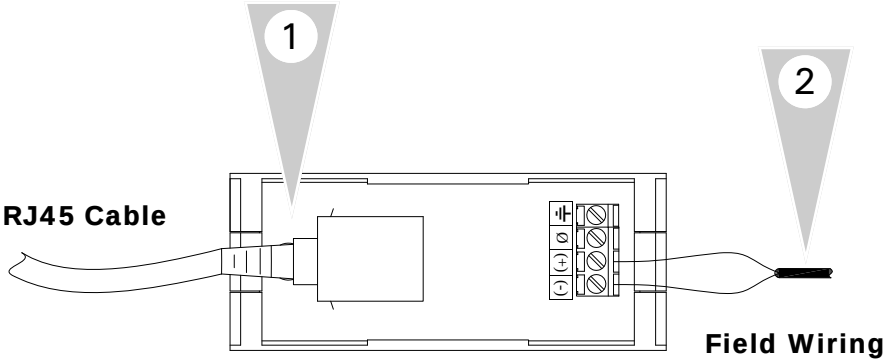
Note: Verify the RJ45 Adaptor jumpers have been set to correspond with the system. Jumpers JP1 and JP2 must be set to ON and JP3 has to be set to position ON. This configuration allows for a Free BUS Topology with the adaptor acting as the termination resistor. Refer to adaptor manual for detailed information.

Overview

1. A RJ45LON Adapter is supplied with the LON version of Versatronik 521 Gateway. Utilize the supplied adapter and connection cable to interconnect the gateway and adapter.
2. Connect the field wiring to terminal X1 for the LON communication.
3. Ensure that the jumpers are correctly positioned.

3

RJ45 Adapter Modbus



Overview

1. A RJ45 Adapter is supplied with the Modbus version of Versatronik 521 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.

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Configuration of Gateway—LON

LON Network Variable	Description	SNVT Type
nviboilerEnable	Value 100 - Lon controls OT communications State - must be 1 Value 0 - Thermostat controls OT communications (gateway in passive mode)	Switch
nviCMode	Value 100 - Setpoint = Boiler Modulation Level State - must be 1 Value 0 - Setpoint = Boiler Temperature Setpoint	Switch
nviSetpoint	Setpoint (temp or modulation see nviCMode)	Temp
nviDHWSetpoint[2]	DHW Set-point	Temp
nvoAlarm	Alarm Type - Alarm Condition or No Condition Alarm limit[0] - OEM Diagnostic Code (byte 1)[1] Alarm limit[1] - OEM Diagnostic Code (byte 2)[1] Alarm limit[2] - OEM Fault Code[1] Alarm limit[3] - Convert to binary[2] 0. Service Request 1. Lockout Reset 2. Low Water Pressure 3. Gas/Flame Fault 4. Air Pressure Fault 5. Water Over Temp	Alarm
nvoBFanSpeed	Boiler Fan Speed in Hertz	Freq Hz
nvoBHETemp	Boiler Heat Exchanger Temperature	Temp
nvoBoilerState	Value - Boiler Modulation Level State - Boiler active / not active	Switch
nvoDHWLowerBound	DHW Lower Bound set-point temperature	Temp
nvoDHWUpperBound	DHW Upper Bound set-point temperature	Temp
nvoDHWSupported	100-1=DHW set-point supported, 0=not supported	Switch
nvoEffectSetpt	Setpoint (*temp or modulation see nviCMode)	Temp
nvoFlueGasTemp	Flue gas (exhaust) Temperature	Temp
nvoLocalOATemp	Outdoor Air Temperature	Temp
nvoMaxModLevel	Maximum Modulation Level (only from thermostat)	Lev Percent
nvoRetTemp	Return Water Temperature	Temp
nvoRoomSetP	Room Setpoint Temperature (only from thermostat)	Temp
nvoRoomTemp	Room Temperature (only from thermostat)	Temp
nvoSupplyTemp	Boiler Water Temperature	Temp
nvoWPressure	Boiler Water Pressure	Press

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).

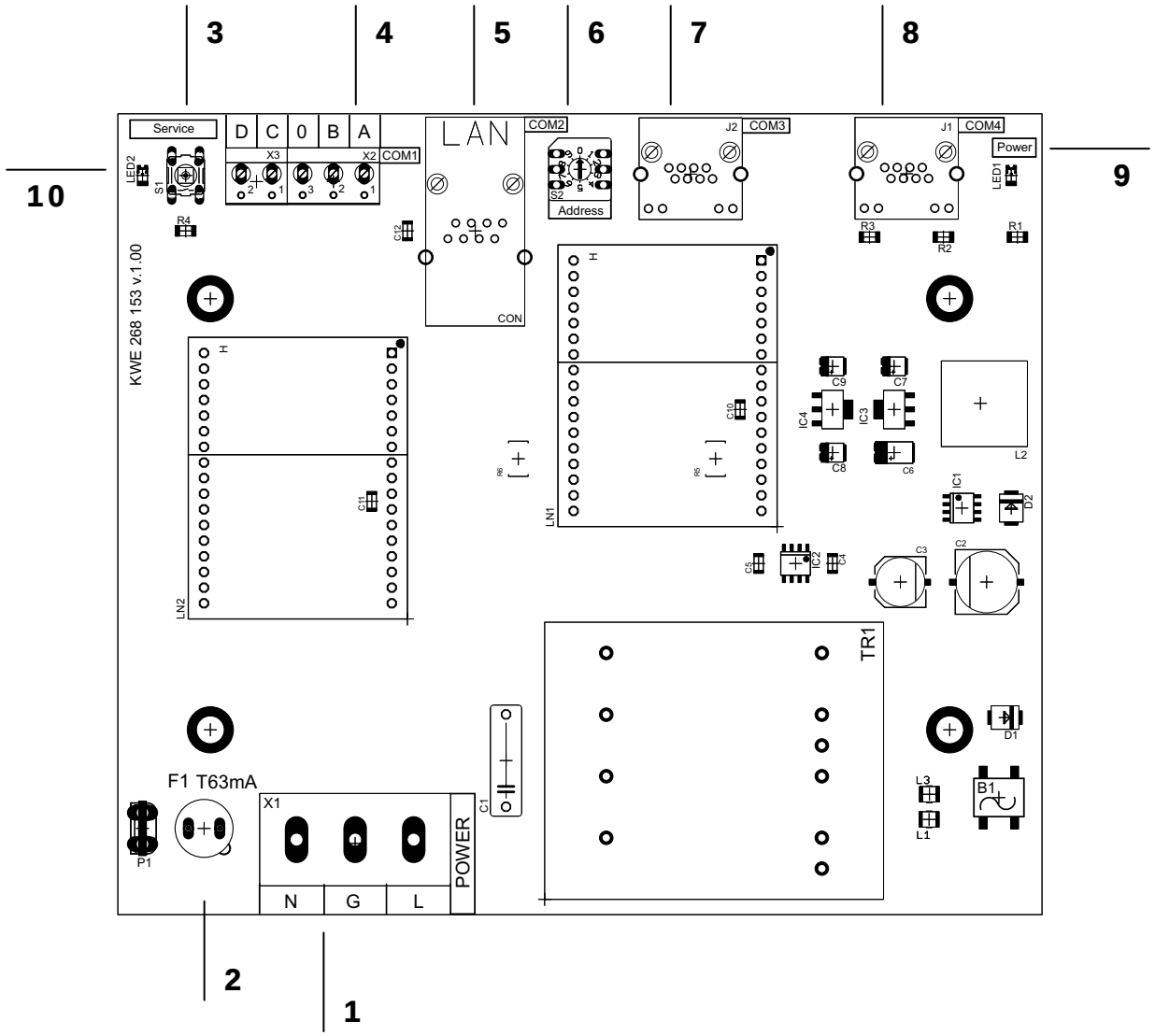
[2] Not all boilers support DHW set-point (ID6, 48, 56). Gateway will automatically adjust DHW set-point to fall between the upper and lower DHW se-point bounds provided by the boiler (ID48).

[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

[4] Convert this value to binary. Bit 0 is the least significant bit.

5	4	3	2	1	0

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

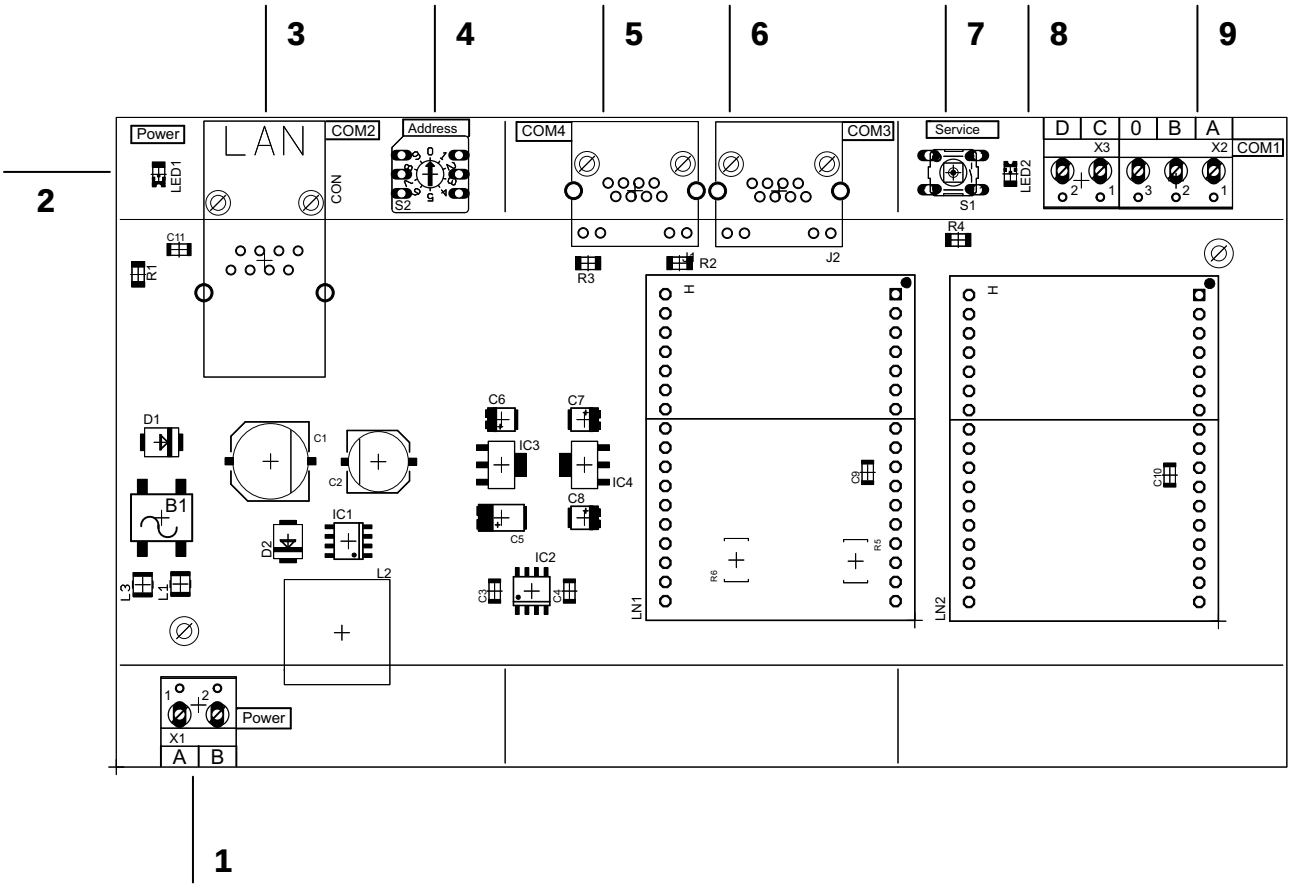
Specifications

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

CAUTION

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.

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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