

USER MANUAL

LDX-B20

150 W Buffer Module



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1 DESCRIPTION

The LDX-B20 is a microprocessor controlled buffer unit rated 20 A usable in 12 V, 24 V, 48 V and 72 V systems. The LDX-B20 monitors the voltage coming from a DC power supply and in case of failure a capacitor bank is used to keep the output regulated for at least 300ms at full load. The main features are:

- Wide operating voltage range (12 - 85 V).
- Compact size.
- Energy storage based on low cost high voltage standard electrolytic capacitors (>150 Joules energy storage).
- Boost max peak power of DC supply.
- Integrates low power step-up (boost) converter to charge the capacitor bank.
- Integrates 20 A step-down (buck) converter to discharge the capacitor bank at an adjustable output voltage in case of mains failure.
- Automatic sensing of the input voltage.
- Relays dry contact and an opto-isolated input for inhibit.
- Integrated safety circuit that disconnects the capacitor bank in case of internal failure.
- Parallelable for power and backup time increase.
- Wide operating temperature (-20°C to 70°C).

1.1 CONNECTORS AND USER INTERFACE

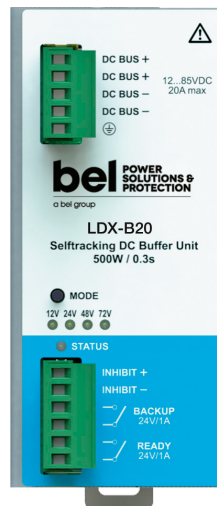


Figure 1. Front View

DC bus: wired in parallel with the DC line to protect.

- **Mode switch button:** used to select the operating voltage range of the LDX-B20. Selects between 12 V, 24 V, 48 V, 72 V or 12 V to 72 V.
- **Mode LEDs:** shows the current operating voltage range of the LDX-B20.
- **Status LED:** bicolored LED (green-red) showing the current status of the unit.
 - **Blinking green:** capacitors are charging.
 - **Static green:** capacitors are charged and the system is ready for buffering.
 - **Blinking red:** unit is buffering.
- **Inhibit:** opto-coupled input used to disable the buffering function.
- **Backup relay:** dry contact closed while the device is buffering.
- **Ready relay:** dry contact closed when the internal capacitors are charged at 1/2 of their maximal energy and the inhibit input is inactive.

1.2 FUNCTIONAL BLOCK

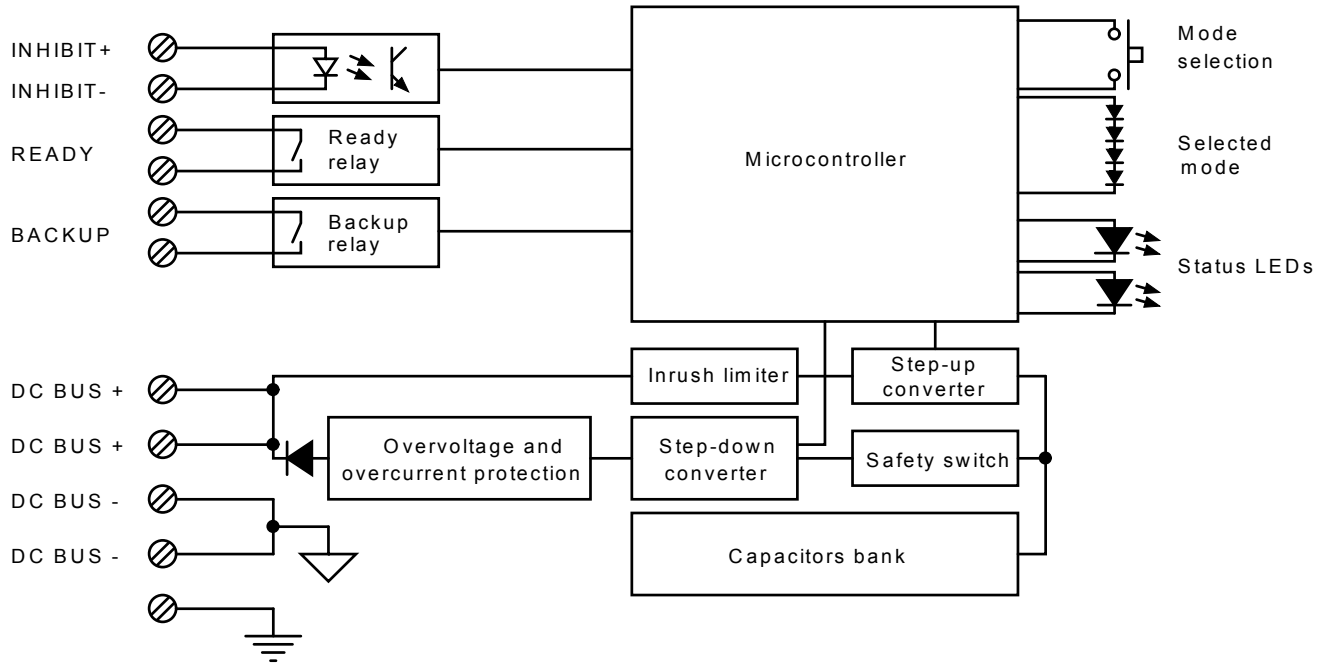


Figure 2. Block diagram

1.3 OPERATION

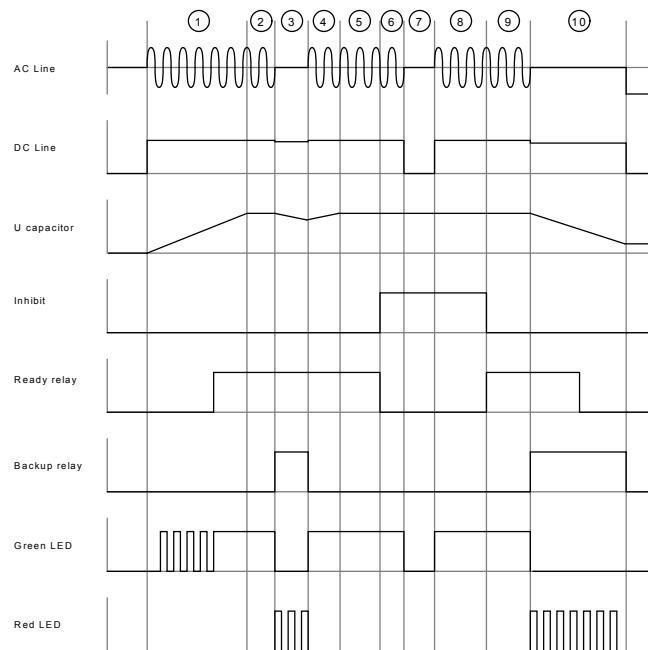


Figure 3. Operating waveforms

The operating waveform shows the normal operation of the LDX-B20. On the waveform the start-up and old-up time of the power supply is ignored.

1. At start-up the units charges the internal capacitor bank up to the maximum voltage. During charging the green LED blinks at 2 Hz. Once the capacitors are charged at 1/2 of their maximal capacity, the green LED goes green and the ready relay activates.
2. The capacitors are fully charged and the unit is ready for buffering.
3. On the first AC power failure the system uses the energy stored on the capacitors to keep the DC line regulated. A small voltage drop is visible on the DC line during buffering; this drop is the forward voltage of the diode placed after the step-down converter. During buffering the backup relay activates and the red LED blinks at 2 Hz.
4. When the AC line returns the unit recharges the capacitor up to the maximum voltage.
5. The capacitors are fully charged and the unit is ready for buffering.
6. The inhibit input is activated; the ready relay is deactivated to notify.
7. On the AC power loss the unit doesn't buffer the DC line because the inhibit input is activated. The unit powers off.
8. When the AC line returns the LDX-B20 turns on. The green LED turns on because the capacitors are already charged.
9. The inhibit input is deactivated. The relay ready activates and the nit is ready for buffering.
10. On AC power loss the unit uses the energy stored on the capacitors to keep the DC line regulated eventually until full discharge.

2 INSTALLATION

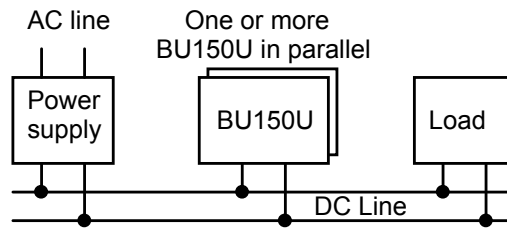


Figure 4. Wiring

12V	24V	48V	72V	Umin	Umax
●	○	○	○	11V	16V
○	●	○	○	21V	29V
○	○	●	○	39V	57V
○	○	○	●	65V	85V
●	●	●	●	11V	85V

Table 1. Modes

The LDX-B20 is placed in parallel with the DC line to protect as shown above. To increase the power and backup time it is allowed to place more than one unit in parallel.

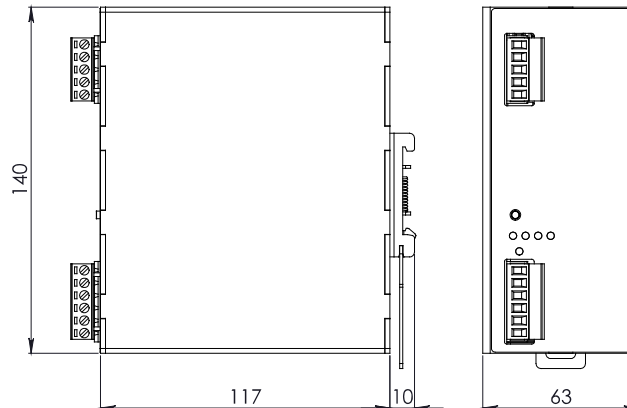
Depending on the application the unit can be configured on 5 different operation modes. The current setting is shown on the 4 mode LEDs present on the front side. The mode selects the voltage range of buffering with the voltages shown on the table above.

The following procedure is used to change mode:

1. Hold the button pressed for more than 3s until the actual mode LED start blinking at 2Hz and then release the button.
2. Click the button until the LED start blinking on the desired mode.
3. Hold the button pressed for more than 3s until the mode LED stop blinking and then release the button.

3 TECHNICAL SPECIFICATIONS

3.1 DIMENSIONS



3.2 GENERAL CHARACTERISTICS

MODEL TYPE	
OUTPUT DATA	
Voltage Unom	Same as Input – 1 V (12/24/48/72 VDC– 1V)
Continuous Output current	20 A
Max duration of the Output Voltage / Load = 20A	600 ms / 12V , 300 ms / 24V , 150 ms / 48 V, 75 ms / 72 V
Ripple @ I Max	< 250 mVpp / 24 VDC
Overload / Short circuit protection	Active – One Shot
Overvoltage protection	Active
Status Signals	“CHARGING / READY” - by LED and dry contact “LOAD ON BUFFER / POWER SUPPLY” - by LED and dry contact
INPUT DATA	
Voltage range	Nominal: 12/24/48/72 VDC – Auto detection
Input current	Max 20 A
GENERAL DATA	
Operating modes User settable by front button	AUTO: follows the SMPS Output voltage Fixed Output voltage (12/24/48/72 VDC)
Control	CPU
Operating temperature	- 20°C to + 70°C
Storage temperature	- 20°C to + 85°C
Humidity	Max RH 95% non condensing
Cooling	Natural convection
Input / ground isolation	0.75 kVDC
Safety standards	CE, LVD
EMC Standards	EN55011 (radiated emission), EN55011 (conducted emission)
Protection degree	IP20 acc. to EN60529
Connection terminals	2.5 mm ² , Pluggable screw type (24 - 12 AWG)
Case material	Aluminum
Approx. weight	0.800 kg
Size (W x H x D)	63.0 x 140.0 x 117.0 mm
Mounting Rail	IEC 60715/H15/TH35-7.5(-15)
Rail mounting information	Vertical, allow 20 mm spacing between adjacent items

Note: Technical parameters are typical and may change without prior notice.