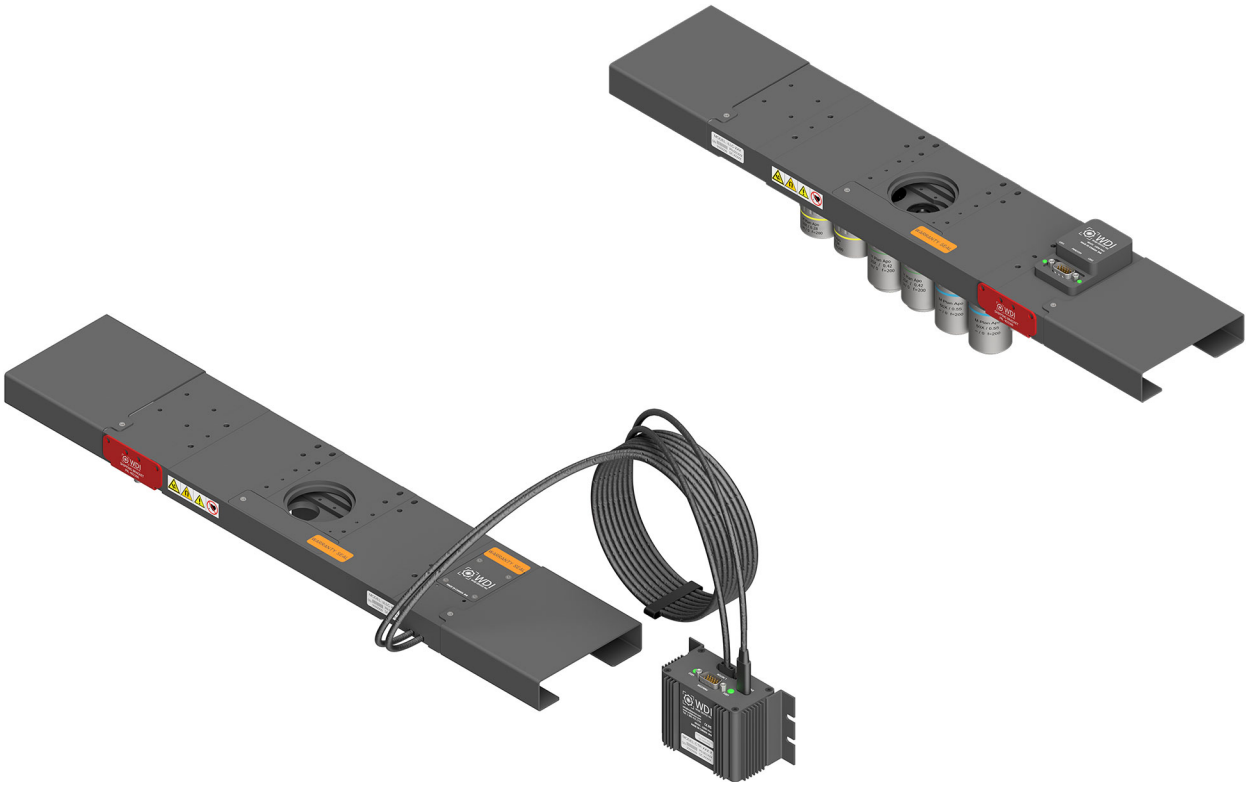
WDI
WISE DEVICE INC

iLLC-LG and sLLC-LG Datasheet



2025

iLLC-LG and sLLC-LG Description

The iLLC-LG and sLLC-LG are linear lens changers that employ a high-power, linear servo motor (i.e., LMotor) to rapidly change the objective lenses that are being used with a microscope or other similar system.

The iLLC-LG includes integrated control electronics. The sLLC-LG uses an external controller. Both models require selection of an insert plate compatible with the microscope objective lens type and quantity.

Ordering Info

Part numbers in *Table 1* include required cabling with corresponding use (either as part of MMS or standalone use).

Table 1 iLLC-LG and sLLC-LG Types

Type	Part Number
Lens Changer (iLLC-LG-MMS)	971890
Lens Changer (iLLC-LG-SA)	971891
Lens Changer (sLLC-LG-SA)	971908

Table 2 Insert Plate Types

Type	Part Number
LC Insert (LCI-LM4) Mitutoyo 4	401311
LC Insert (LCI-LM5) Mitutoyo 5	401109
LC Insert (LCI-LM6) Mitutoyo 6	402024
LC Insert (LCI-LQ3) QiOptiq 3	401110
LC Insert (LCI-LQ4) QiOptiq 4	401877
LC Insert (LCI-LO6-0.800"-36TPI) Olympus 6	402215
LC Insert (LCI-LO5) Olympus 5	401180
LC Insert (LCI-LL6) Leica/Nikon 6	401988

Product Specifications

Table 3 iLLC-LG and sLLC-LG General Specifications

Parameter	Specification
Motor Shaft Diameter	16 mm
Motor Type Linear	Linear direct drive
Moving Weight With Typical Insert Plate	1.613 kg
Encoder Type Linear	Linear incremental encoder
Encoder Resolution	0.078125 µm
Controller Type	Digital servo drive
Controller Options	Integrated or separated
Positional Repeatability	±0.25 µm

Table 4 iLLC-LG and sLLC-LG Specifications

Specifications	Value				
Insert Plate	3	4	5	6	
Objective Lens Type	QiOptiq mag.x	QiOptiq mag.x or Mitutoyo	Mitutoyo or Olympus	Mitutoyo or Olympus	Leica or Nikon
Objective Ring Light Illumination	Yes (2 lenses)	No	No	No	
Weight for iLLC-LG, excluding insert plate and lenses	3.4 kg				
Weight for sLLC-LG, excluding insert plate and lenses	3.1 kg				
Controller	Integrated or Separated				
Default Parameters[a]					
Acceleration (AC)	4500 mm/s^2				
Deceleration (DC)	4500 mm/s^2				
S-Curve Time (SF)	10 ms				
Maximum Speed (SP)	700 mm/s				
Performance[b]					
Lens-to-Lens Change Time	0.6 s				
First-to-Last Lens Change Time	1 s				

a. Default parameters with turret fully loaded and <2 m/s^2 external force.

b. Measured with turret fully loaded, default parameters, and 48 VDC power. Lower voltage may increase lens change times.

Table 5 iLLC-LG and sLLC-LG Lens Spacing Specifications

Specifications	Value			
Objective Lens Type	M25x0.75 (Typical Nikon)	M26x36TPI (Typical Mitutoyo)	W0.8"-36 (RMS) (Typical Olympus)	M34x0.75 (Typical Qioptic)
Lens Spacing Center to Center	6 lens - 32.8 mm	4 lens - 54.667 mm 5 lens - 41 mm 6 lens - 35 mm	5 lens - 41 mm 6 lens - 32.8 mm	3 lens - 53 mm 4 lens - 54.667 mm

For more details on insert specifications see *"Insert Plate Dimensions" on page 8.*

Electrical Connections

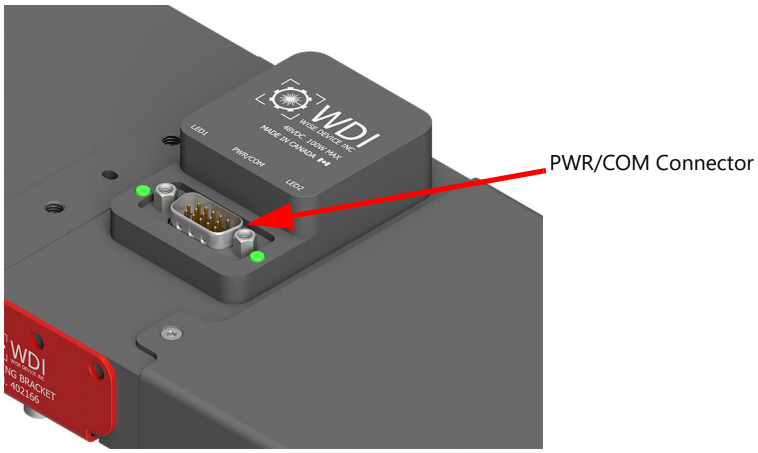


Figure 1 *Connectors – Integrated Controller*

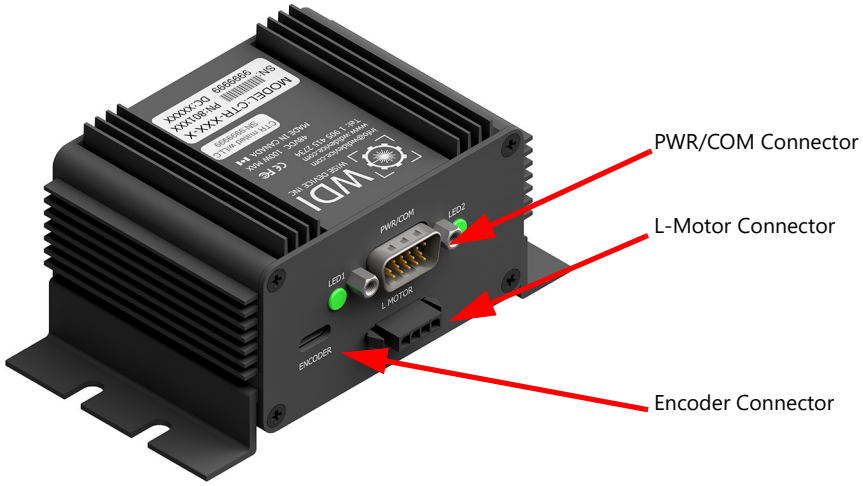


Figure 2 *Connectors – Separated Controller*

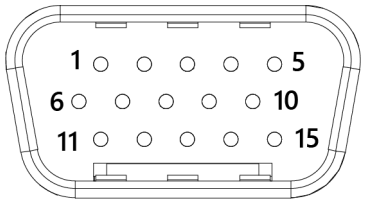


Figure 3 *PWR/COM Connector (DB15HD) Male Pins*

Table 6 PWR/COM Connector Pins

Pin #	Signal	Function
1	VCC	+24VDC or +48VDC
2	GND	Power supply return
3	DO1	Digital output 1
4	CANH	CAN BUS high

Table 6 PWR/COM Connector Pins (continued)

Pin #	Signal	Function
5	CANL	CAN BUS low
6	VCC	+24VDC or +48VDC
7	GND	Power supply return
8	GND	Power supply return
9	DI3	Digital input 3
10	DO2	Digital output 2
11	RS485-	RS485 Differential signal (negative)
12	RS485+	RS485 Differential signal (positive)
13	GND	IOs return
14	IO4/E-STOP	Emergency stop input. In order to de-activate emergency stop, drive high (+5VDC to +48VDC)
15	DO5	Digital output 5
Shield	GND	CH Chassis ground

Electrical Specifications

Table 7 iLLC-LG and sLLC-LG Electrical Specifications

Parameter	Minimum	Typical	Maximum	Units
Operating Voltage	22	24 or 48[a]	49	VDC
Operating Current			5	A
E-Stop Input Voltage High (VIH)	5	24 or 48	49	VDC
E-Stop Input Voltage Low (VIL)	-0.5		2	VDC
E-Stop Input Current		7		mA

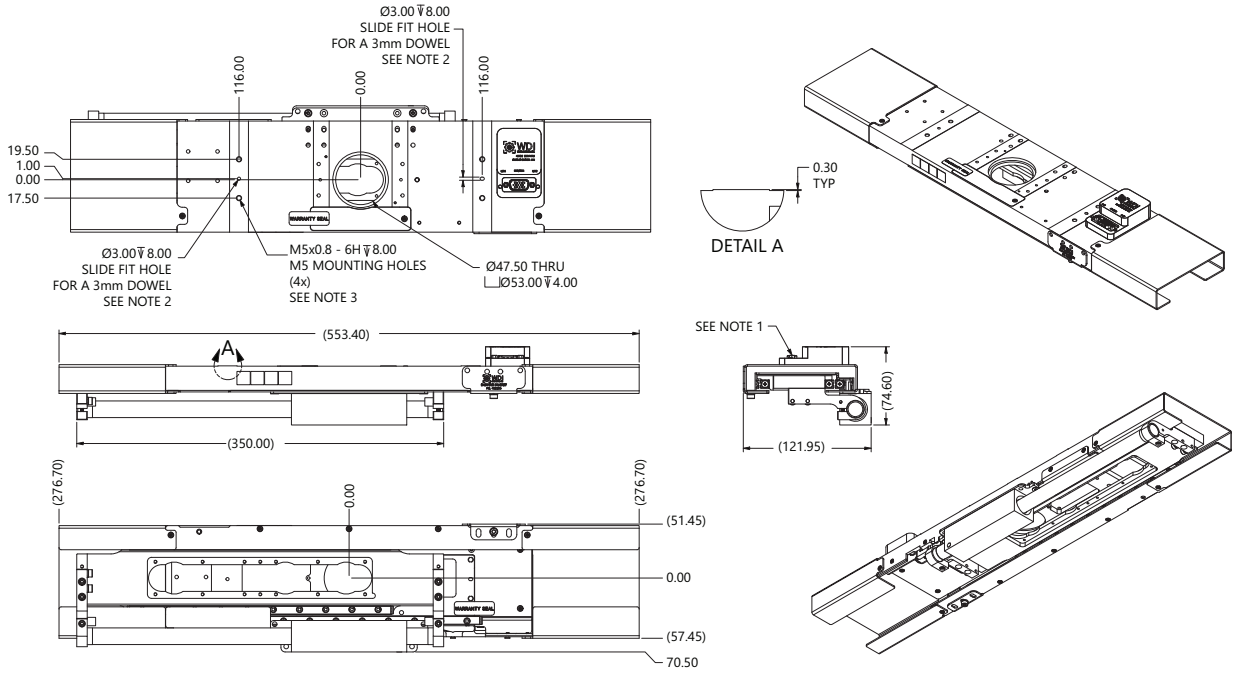
a. Recommended for maximum performance.

Environmental Specifications

Table 8 iLLC-LG and sLLC-LG Environmental Specifications

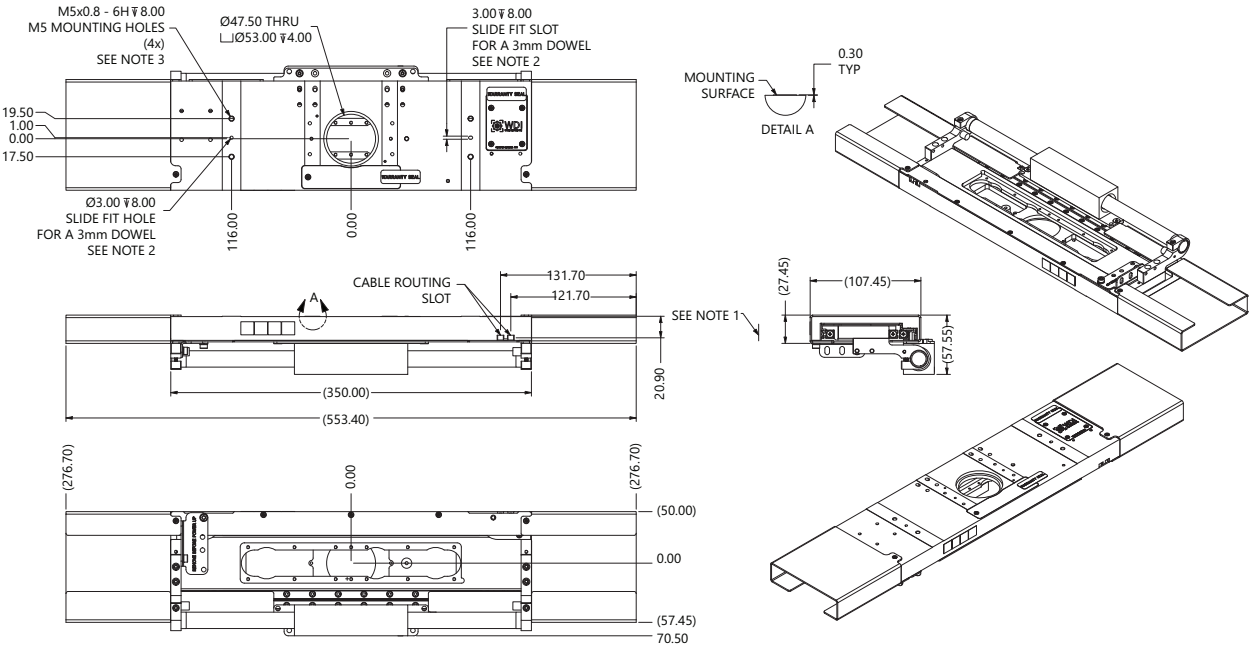
Description	Value
Operating Ambient Temperature	20°C to 30°C
Transport Temperature (sealed container)	-20°C to 50°C
Storage Temperature	10°C to 40°C
Humidity Temperature	10% to 80% non-condensing

Mechanical Dimensions



NOTES:
1. Allow an extra 80mm space for connector and wire bend radius.
2. Ø3mm indexing dowels need to be removed once the LLC is secured with M5 screws. The dowels should not protrude into the main body by more than 8mm.
3. M5 mounting screws should not protrude into the main body more than 8mm to avoid any interference with the moving components.
4. Various insert plates with different thread types and pitch can be installed as per requirement.
5. Approximate weight of the LLC is 2.75 Kg.

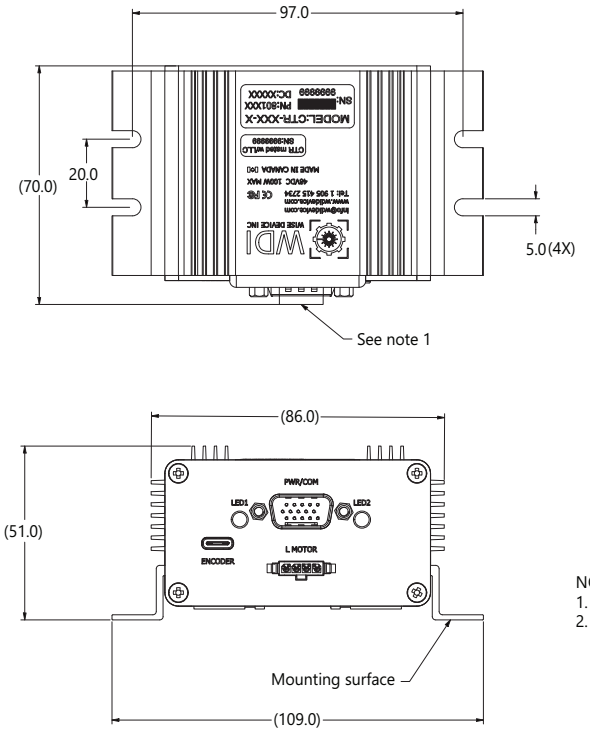
Figure 4 *iLLC-LG Dimensions*

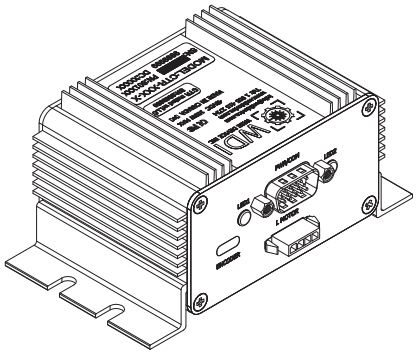


NOTES:
1. Allow an extra 40mm space for connector and wire bend radius.
2. Ø3mm indexing dowels need to be removed once the LLC is secured with M5 screws. The dowels should not protrude into the main body by more than 8mm.
3. M5 mounting screws should not protrude into the main body more than 8mm to avoid any interference with the moving components.
4. Various insert plates with different thread types and pitch can be installed as per requirement.
5. Approximate weight of the LLC is 2.49 Kg.

Figure 5 *sLLC-LG Dimensions*

sLLC Controller Dimensions





NOTES:
1. Allow an extra 100 mm for cable bend radius.
2. Approximate weight of 0.22 Kg does not include cables.

Figure 6 *sLLC Controller Dimensions*

Insert Plate Dimensions

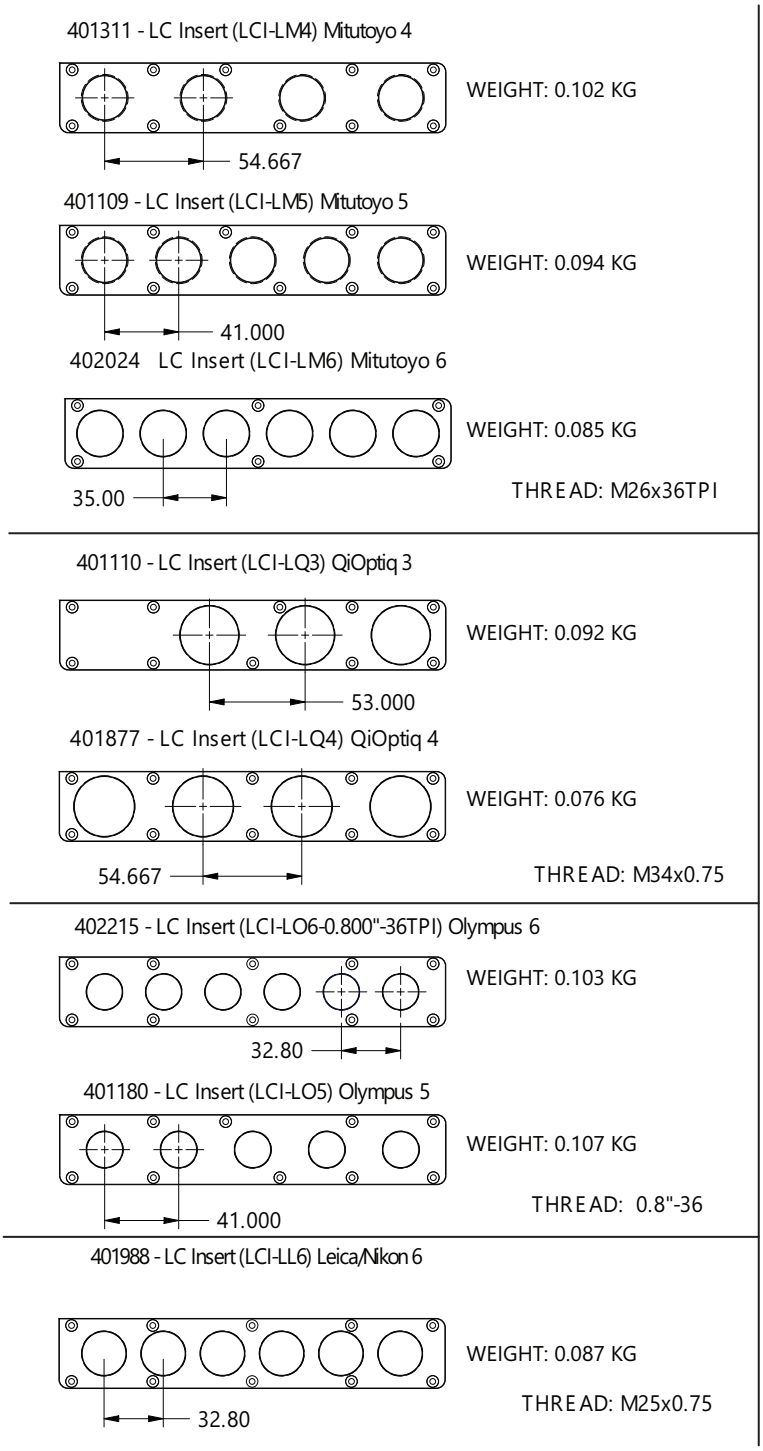


Figure 7 *iLLC-LG and sLLC-LG Insert Plates*

Accessories

Table 9 iLLC-LG and sLLC-LG Accessories

Accessory	Part Number	Remarks
Cable (CAB-LLC-MMS), (300 mm)	801443	300 mm length (for attached and integrated controller configurations)
Cable (CAB-LLC-MMS), (1000 mm)	801443-1	1 m length (for separated controller configuration)
Cable (CAB-LLC-USBRS485), (1800mm)	801444	1800 mm in length (for standalone configuration)

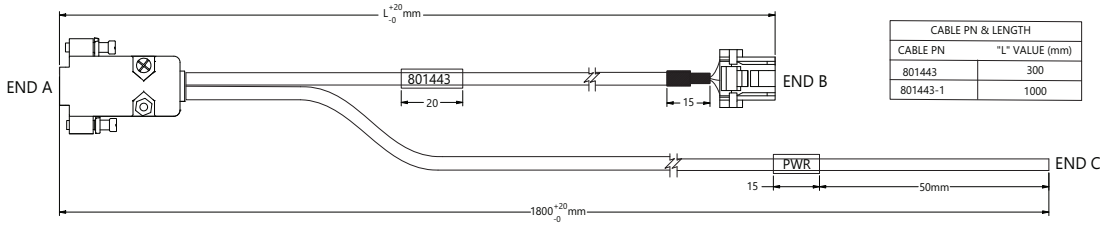


Figure 8 *CAB-LLC-MMS Cable Wiring*

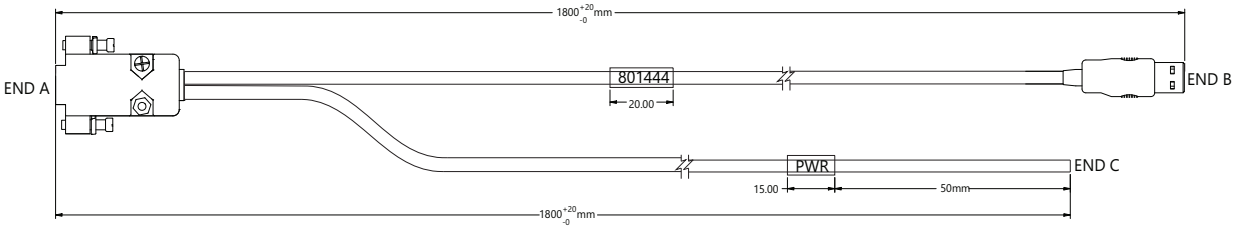


Figure 9 *CAB-LLC-USBRS485 Cable Wiring*