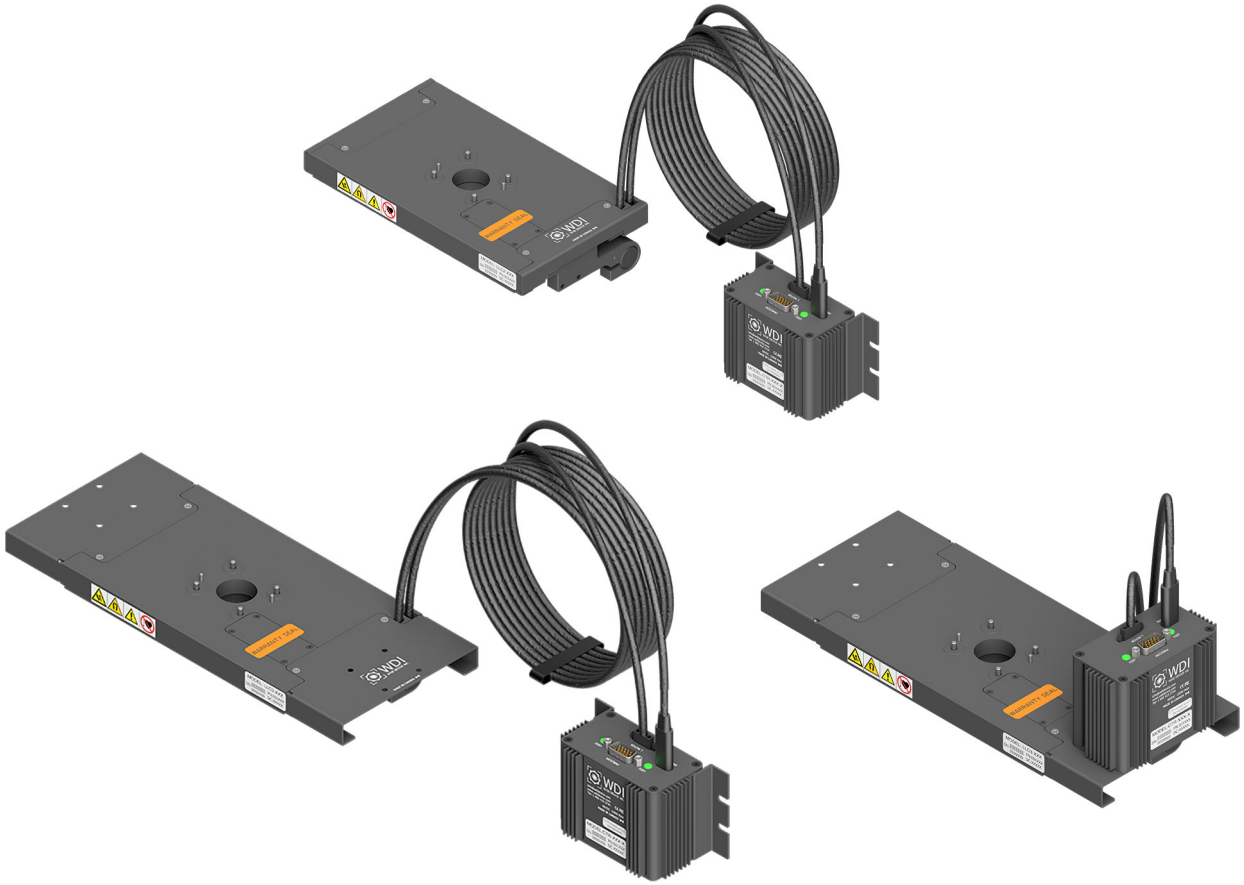
WDI
WISE DEVICE INC

LLC2 and LLC3 Datasheet



2025

LLC2 and LLC3 Description

The LLC2 and LLC3 are linear lens changers that employ a high-power, linear servo motor (for example, L-Motor) to rapidly change the objective lenses that are being used with a microscope or other similar system.

The LLC2 includes an external controller. The LLC3 includes either an external controller or an attached controller.

Ordering Info

Table 1 LLC2 and LLC3 Types

Type	Part Number
Lens Changer (LLC2), w/Controller (CTR-LLC-S) Lens changer with separated controller	971902
Lens Changer (LLC3), w/Controller (CTR-LLC-S) Lens changer with separated controller	971906
Lens Changer (LLC3), w/Controller (CTR-LLC-A) Lens changer with attached controller	971904

Product Specifications

Table 2 LLC2 and LLC3 General Specifications

Specifications	Value	
	LLC2	LLC3
Maximum Number Of Lens Inserts	2	3
Objective Lens Type	M26x36TPI Thread (Typical Mitutoyo)	
Weight Excluding Lenses (kg)	1.30	1.80
Recommended Load (kg)	0.60	0.95
Lens Spacing Center To Center (mm)	35	38
Lens Change Time[a] (s)	0.3 s (35 mm spacing)	Adjacent: 0.3 s First-to-Last: 0.4 s (38 mm spacing)
Motor Type	Direct drive linear shaft motor	
Motion Actuation Implementation	Fixed forcer and encoder head	
Encoder	Linear optical encoder – 0.078 µm resolution	
Servo Type	Digitally controlled linear servo	
Positioning Repeatability	±0.16 µm	
Bearings	High precision cross-roller with anti-creep	
Acceleration (AC) (mm/s^2)	4500	

Table 2 LLC2 and LLC3 General Specifications (continued)

Specifications	Value	
	LLC2	LLC3
Deceleration (DC) (mm/s^2)	4500	
Maximum Speed (SP) (mm/s)	700	

a. Measured with 48VDC input voltage, with recommended load and default speed, acceleration and deceleration. Changing any of theses parameters may affect performances. Lower voltage may increase lens change times.

Electrical Connections

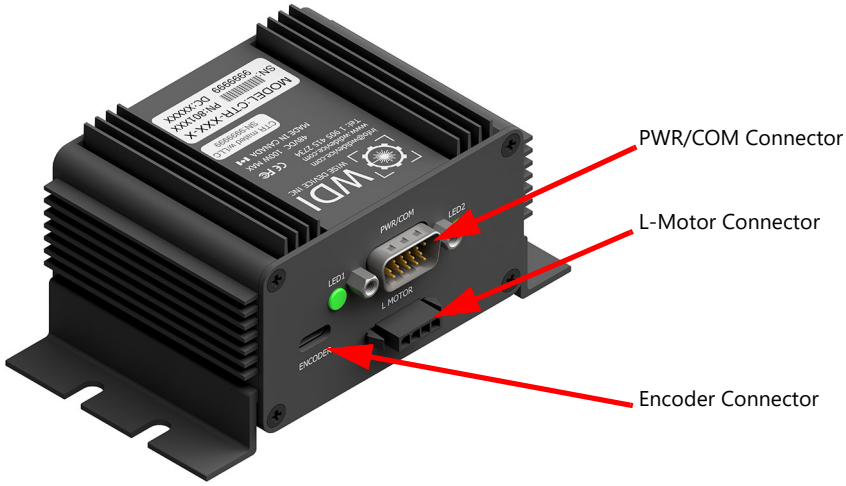


Figure 1 *Controller Connectors*

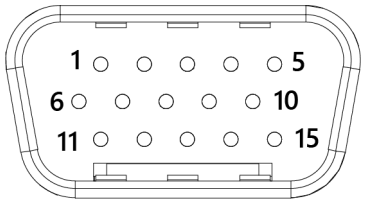


Figure 2 *PWR/COM Connector (DB15HD) Male Pins*

Table 3 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
5	CANL	CAN BUS low
6	VCC	+24VDC or +48VDC
7	GND	Power supply return

Table 3 PWR/COM Connector Pins (continued)

Pin #	Signal	Function
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 4 LLC2 and LLC3 Electrical Specifications

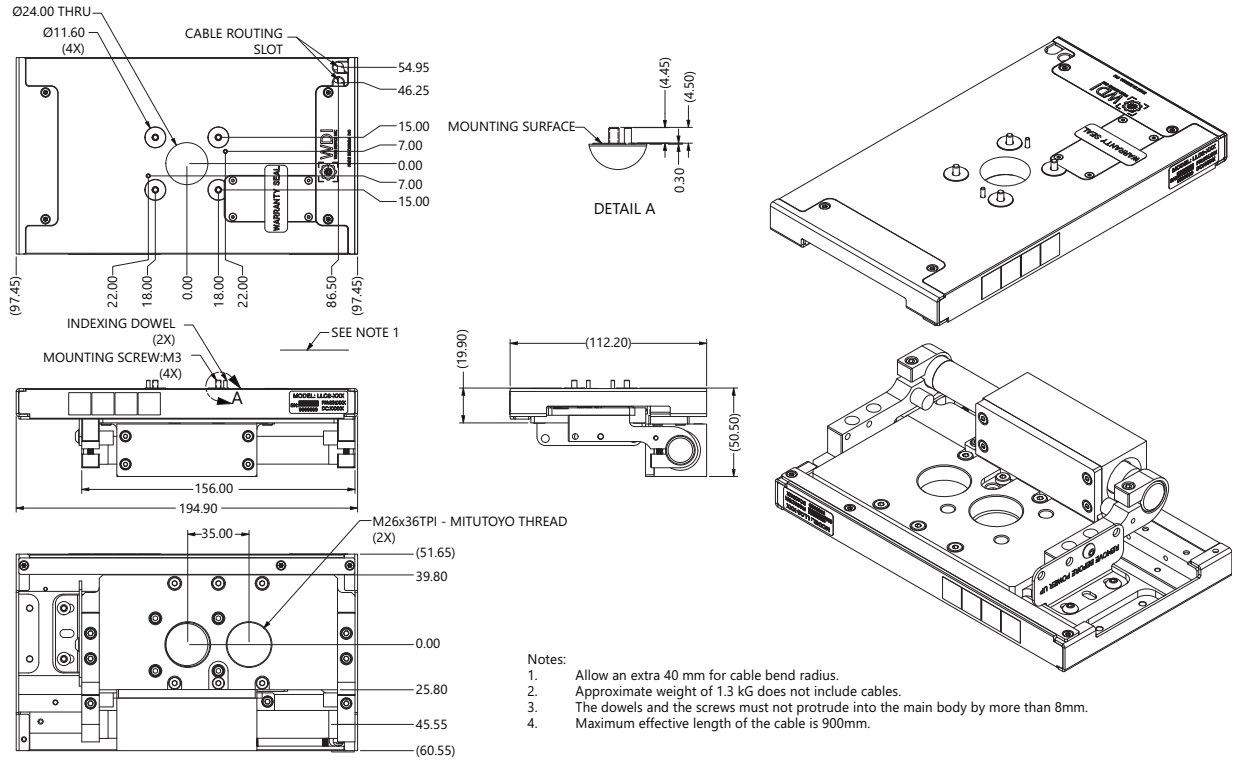
Parameter	Minimum	Typical	Maximum	Units
Supply Input Voltage	22	24 or 48	49	VDC
Supply Input Current			5	A
E-Stop Input Voltage High (VIH)	5	24 or 48	49	VDC
E-Stop Input Voltage Low (VIL)	-0.5		2	VDC
E-Stop Input Current		7		mA

Environmental Specifications

Table 5 LLC2 and LLC3 Environmental Specifications

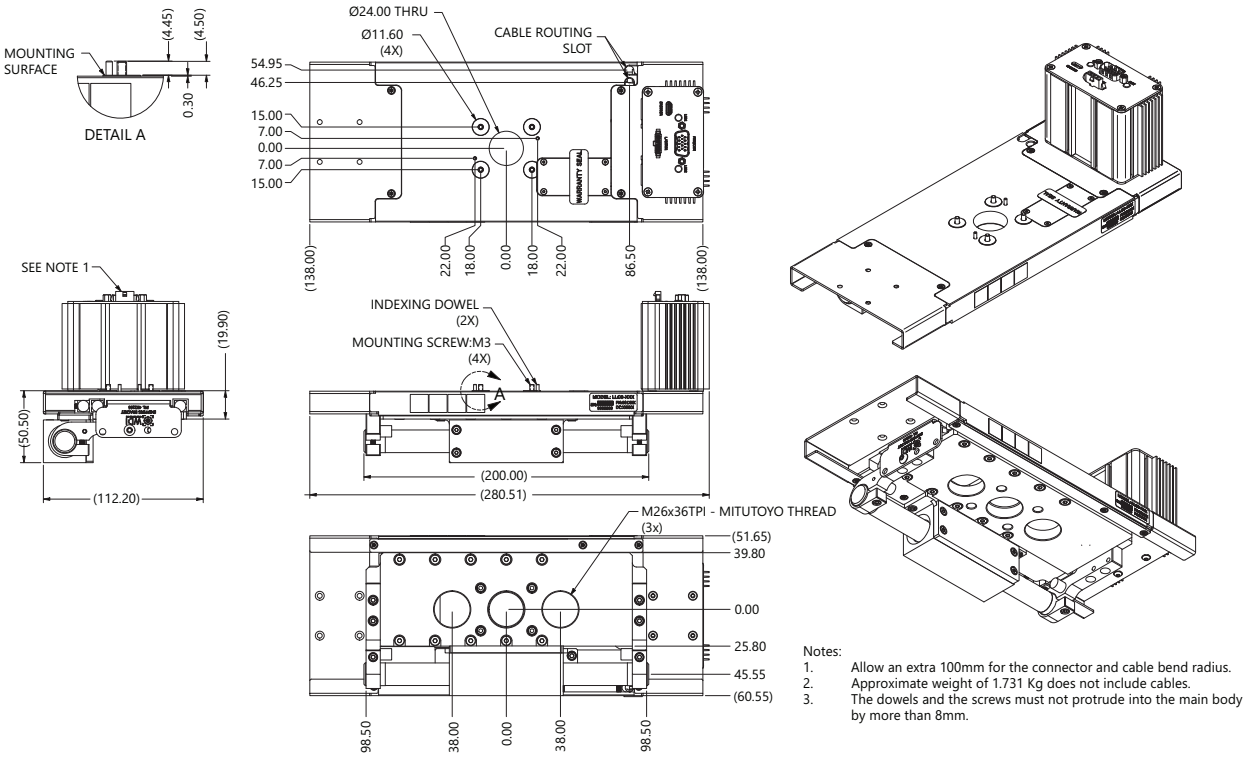
Description	Value
Operating Ambient Temperature	20ºC to 30ºC
Transport Temperature (sealed container)	-20ºC to 50ºC
Storage Temperature	10ºC to 40ºC
Humidity Temperature	10% to 80% non-condensing

Mechanical Dimensions



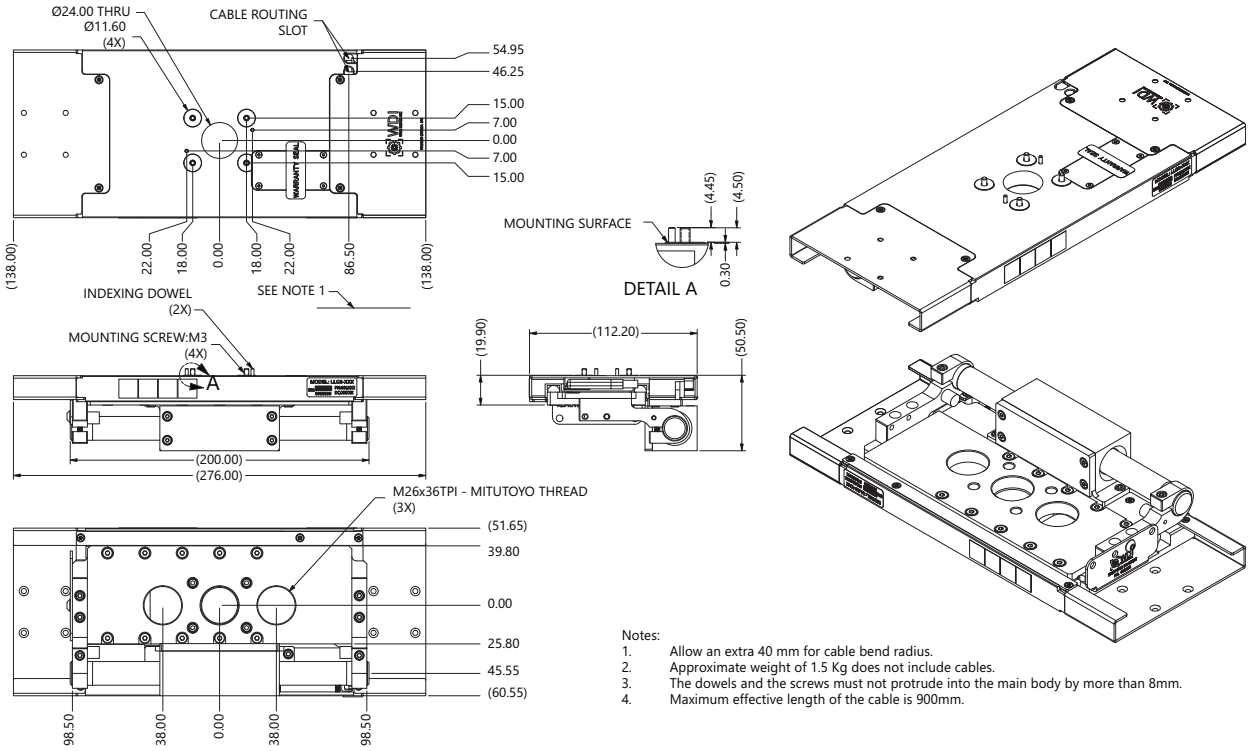
Notes:
1. Allow an extra 40 mm for cable bend radius.
2. Approximate weight of 1.3 kG does not include cables.
3. The dowels and the screws must not protrude into the main body by more than 8mm.
4. Maximum effective length of the cable is 900mm.

Figure 3 *LLC2 Kit Dimensions*



Notes:
1. Allow an extra 100mm for the connector and cable bend radius.
2. Approximate weight of 1.731 Kg does not include cables.
3. The dowels and the screws must not protrude into the main body by more than 8mm.

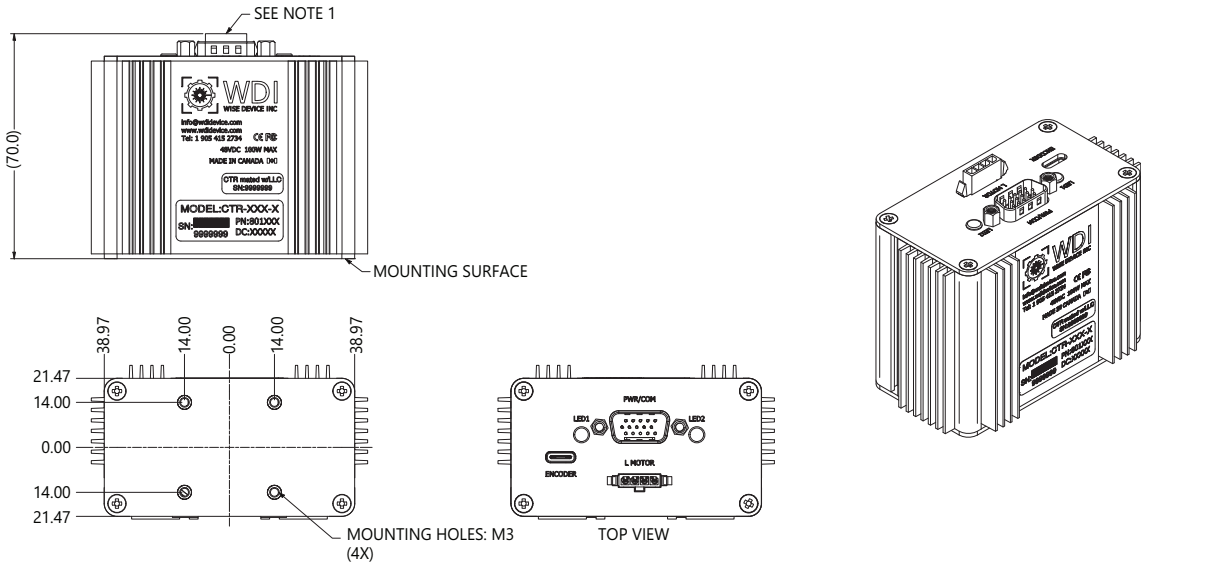
Figure 4 *LLC3 With Attached Controller Kit Dimensions*



Notes:
1. Allow an extra 40 mm for cable bend radius.
2. Approximate weight of 1.5 Kg does not include cables.
3. The dowels and the screws must not protrude into the main body by more than 8mm.
4. Maximum effective length of the cable is 900mm.

Figure 5 *LLC3 Kit Dimensions*

Attached and Separated Controller Dimensions

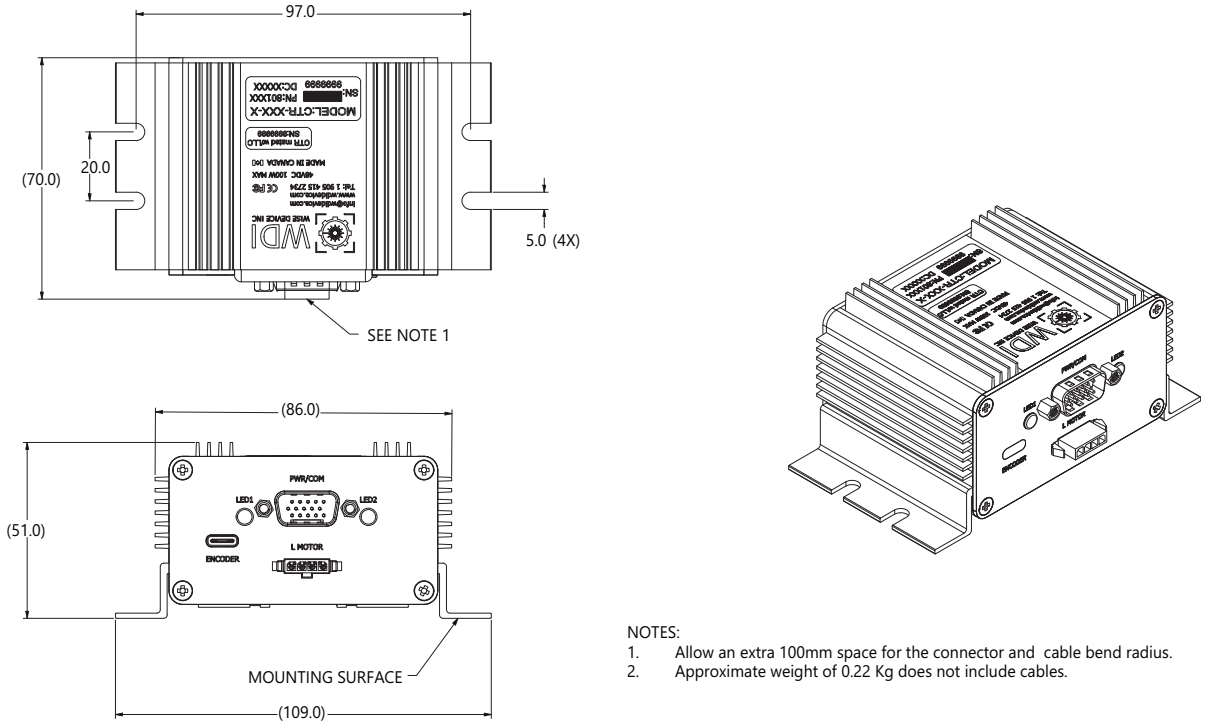


NOTES:
1. Allow an extra 100mm space for the connector and cable bend radius.
2. Approximate weight of 0.212 kG does not include cables.

NOTE: To mount on LLC, use M3x4mm button head screws with M3 lock washers. Do not use longer screws.

Caution:
Maximum allowed protrusion of mounting screws inside the endplate = 1.5mm
All screws to have at least one locking mechanism
-Service removable thread locker or locking washer.

Figure 6 *Attached Controller Dimensions*



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

Figure 7 *Separated Controller Dimensions*

Available Accessories

Table 6 LLC2 and LLC3 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

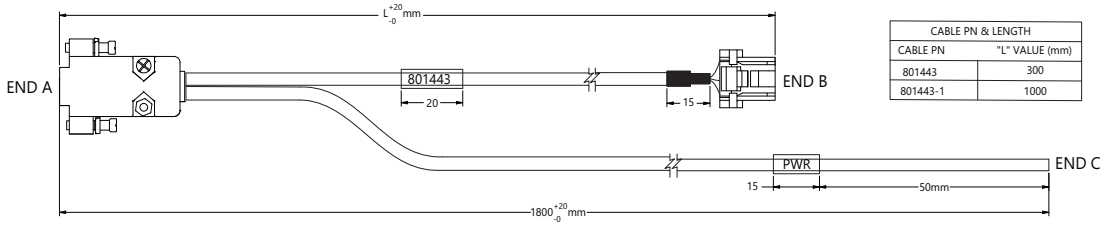


Figure 8 *CAB-LLC-MMS Cable Wiring*

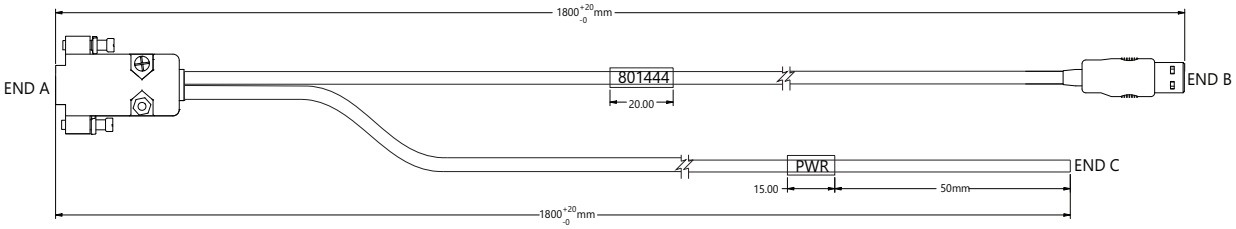


Figure 9 *CAB-LLC-USBRS485 Cable Wiring*