General Notes on Termination:

For LDM485 or other RS-485 device at the extreme ends of the line:

The need for termination depends on data rate, line length, cable electrical characteristics and environment, and if applicable, the number of multidropped devices. This is best determined by switching in or out each termination network for most reliable data transfer.

For LDM485, some terminations may need to be added externally.

For TD (Transmit Data), 120Ω may be needed across the lines in the 4-wire configurations.

For RS-485 devices other than the LDM485, termination networks may be need to be added externally.

For TD (Transmit Data), 120Ω across the lines is standard.

For RD (Receive Data), 120Ω across the lines may suffice.

However, some cases may need line bias resistors as well. The line bias resistors hold the true data line (B', +, DATA) at least 0.2V more positive than the inverted data line (A', −, DATA*) in the MARK (idle) state. The network will consist of a 3.3KΩ pull-up resistor connected to +5.0V at one end to the true data line and the 120Ω resistor at the other end. Then a 3.3KΩ pull-down resistor connected to Return at one end to the inverted data line and the 120Ω resistor at the other end. If +5V and/or Return are not available externally, you may have to contact the manufacturer to find out how to access these internally. Another alternative is to install your own +5V power supply and connect its negative terminal to the RS-485 device's RS-485 Return. Also, if the RS-485 circuits are isolated, use an isolated output power supply.
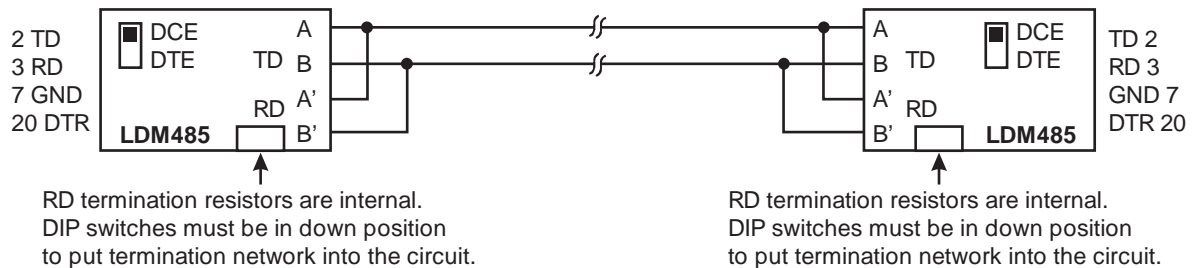
For LDM485 or other RS-485 device multidropped between the extreme ends of the line:

All terminations should be disconnected from the line.

LDM485 Connections, Half Duplex – 2-wire, Point-to-Point

LDM485 to LDM485

Pin 20 DTR must be controlled at both ends: + V to energize TD_B^A, -V to high impedance TD_B^A. Only one TD_B^A should be energized at a time!

RD termination resistors are internal.
DIP switches must be in down position
to put termination network into the circuit.

RD termination resistors are internal.
DIP switches must be in down position
to put termination network into the circuit.

LDM485 to Other RS-485 Device

Pin 20 DTR must be controlled: + V to energize TD_B^A, -V to high impedance TD_B^A. Only one TD_B^A should be energized at a time!

RD termination resistors are in the circuit.
DIP switches must be in down position.

Add external termination resistor if no internal termination resistor provided.

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LDM485 Connections, Half Duplex – 2-wire, Multidrop

LDM485 to LDM485

Pin 20 DTR must be controlled at every LDM485: + V to energize TD_B^A, -V to high impedance TD_B^A.
Only one TD_B^A should be energized at a time!

2 TD
3 RD
7 GND
20 DTR

DCE
DTE
LDM485
A
TD B
RD A'
B'

A
B TD
A' RD
B'
DCE
DTE
LDM485

TD 2
RD 3
GND 7
DTR 20

RD termination resistors are internal.
DIP switches must be in down position to
put termination network into the circuit.

RD termination resistors are internal.
DIP switches must be in down position to
put termination network into the circuit.

Keep short
2 meters
or less.

Keep short
2 meters
or less.

A B A' B'
TD RD
DCE
DTE
LDM485

A B A' B'
TD RD
DCE
DTE
LDM485

2 TD
3 RD
7 GND
20 DTR

2 TD
3 RD
7 GND
20 DTR

All other LDM485's:
RD termination resistors are out of the circuit.
DIP switches must be in up position.

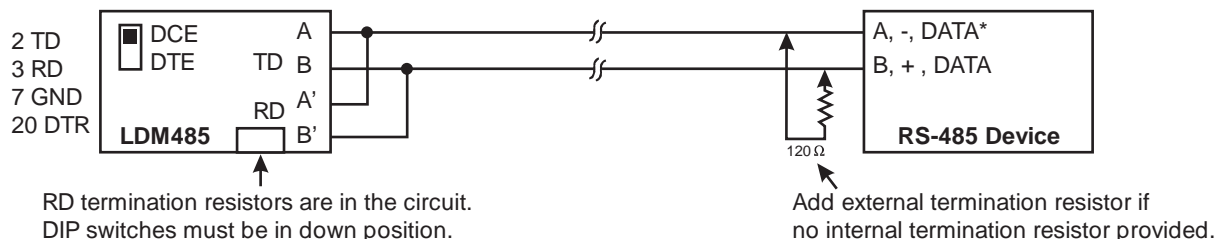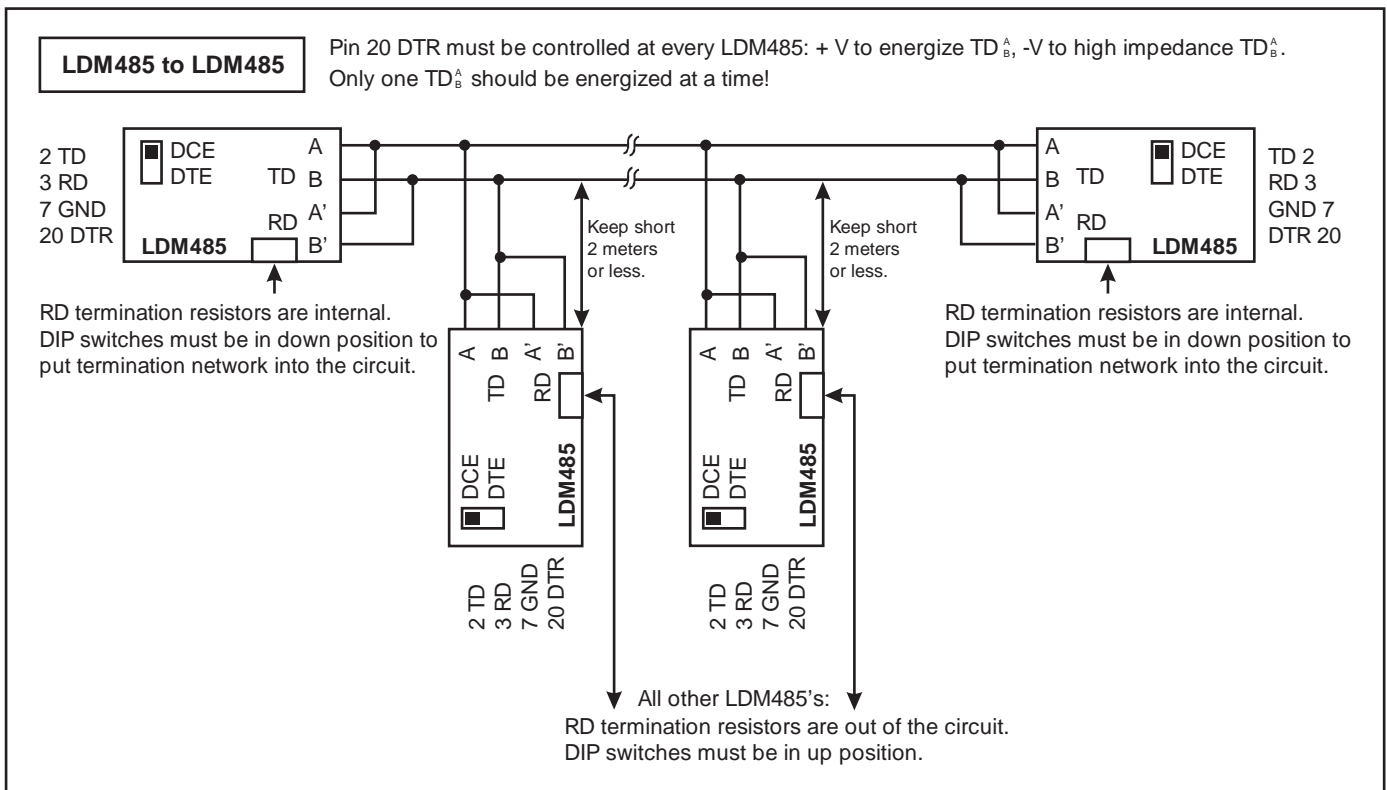## LDM485 Connections, Half Duplex – 2-wire, Multidrop

LDM485 to Other RS-485 Devices
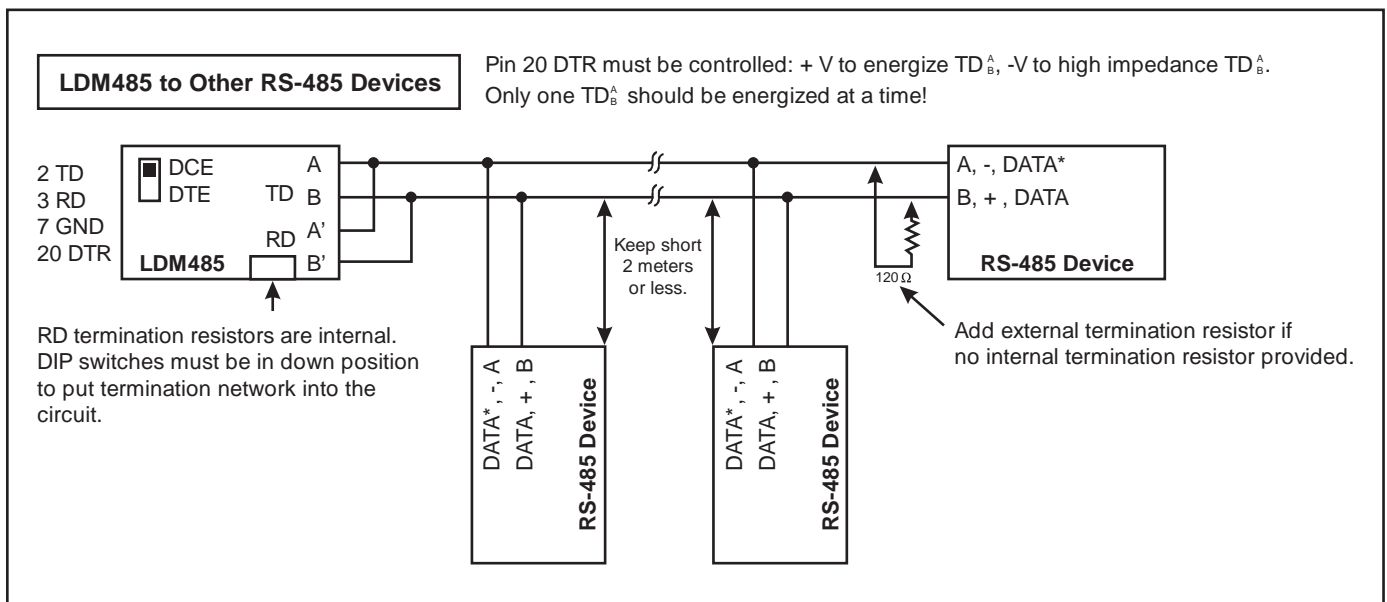
Pin 20 DTR must be controlled: + V to energize TD_B^A, -V to high impedance TD_B^A.
Only one TD_B^A should be energized at a time!

2 TD
3 RD
7 GND
20 DTR

DCE
DTE
LDM485
A
TD B
RD A'
B'

A, -, DATA*
B, +, DATA
RS-485 Device

120 Ω

RD termination resistors are internal.
DIP switches must be in down position
to put termination network into the
circuit.

Keep short
2 meters
or less.

Add external termination resistor if
no internal termination resistor provided.

DATA* , -, A
DATA, +, B
RS-485 Device

DATA* , -, A
DATA, +, B
RS-485 Device

LDM485 Connections, Full Duplex – 4-wire, Point-to-Point

LDM485 to LDM485

Pin 20 DTR must be asserted for the LDM485 to transmit data. This is normally done by the host computer. If this is not possible, Pin 20 DTR can be connected to pin 8 RLSD at each LDM485 to energize TD_B^A. However, this causes TD_B^A to go high impedance with each SPACE (0) bit received at $RD_{B'}^{A'}$ effectively reducing communication to half duplex.

2 TD		
3 RD	DCE	A
7 GND	DTE	TD B
20 DTR		RD A'
8 RLSD	**LDM485**	B'

120 Ω

120 Ω

A'	DCE	2 TD
B' RD	DTE	3 RD
A		7 GND
B TD	**LDM485**	20 DTR
		8 RLSD

RD termination resistors are internal. DIP switches must be in down position to put termination network into the circuit.

Add external termination resistors.

RD termination resistors are internal. DIP switches must be in down position to put termination network into the circuit.

LDM485 Connections, Half Duplex – 4-wire, Multidrop

LDM485 to Other RS-485 Devices

Pin 20 DTR must be asserted for the LDM485 to transmit data. This is normally done by the host computer. If this is not possible, Pin 20 DTR can be connected to pin 8 RLSD to energize TD_B^A. Only one TD_B^A should be energized at a time!

Add external termination resistor.

2 TD	DCE	A
3 RD	DTE	TD B
7 GND		A'
20 DTR		RD A'
8 RLSD	**LDM485**	B'

120 Ω

120 Ω

120 Ω

A'	RD	
B'		
A	TD	
B	**RS-485 Device**	

RD termination resistors are internal. DIP switches must be in down position to put termination network into the circuit.

Keep short 2 meters or less.

Add external termination resistor if no internal termination resistor provided.

A' B'	A B
RD	TD

RS-485 Device

A' B'	A B
RD	TD

RS-485 Device