

### MAXIMUM CRITICAL PATH LENGTHS FOR TWO-WIRE PATHS

Nominal Wire Size	Ohms/1000' Ohms/Km	MAXIMUM LENGTH FOR CRITICAL PATH			
		LOOP		STAR	
		Km	Miles	Km	Miles
2.5 mm <sup>2</sup>	15.00 Ohms/Km	12.0	7.5	3.0	1.8
14 AWG	2.58 Ohms/1000'	15.2	9.6	3.8	2.4
12 AWG	1.62 Ohms/1000'	24.4	15.2	6.1	3.8
10 AWG	1.02 Ohms/1000'	39.2	24.4	9.8	6.1

### CHARACTERISTIC TABLE FOR VARIOUS DECODER MODELS

DECODER MODEL	NUMBER OF ADDRESSES PER DECODER	MAXIMUM NUMBER OF SOLENOIDS PER ADDRESS	MAXIMUM ADDRESSES OPERATING AT ONCE	CURRENT DRAW (MA AT REST PER DECODER)
FD-101	1	1	1	0.5 mA
FD-102	1	2	1	0.5 mA
FD-202	2	2	2	1.0 mA
FD-401 <sup>1</sup>	4	1	4	1.0 mA
FD-601	6	1	4	1.0 mA

### DESIGN CRITERIA FOR DECODER SYSTEMS

CONDITION	CIRRUS	NIMBUS II	STRATUS II	STRATUS LT
Maximum resistance in critical path	33 Ohms	33 Ohms	33 Ohms	33 Ohms
Maximum number of addresses per wire path <sup>2</sup>	250	250	250	200
Maximum number of addresses per MDI/LDI	500	500	500	300
Maximum number of addresses per SDI	200	200	200	200
Maximum number of active solenoids per wire path	20	20	20	15
Interface unit	LDI/MDI	LDI/MDI	LDI/MDI	SDI
Maximum number of active solenoids per interface <sup>3</sup>	40	40	30	15
Active solenoid current draw (mA)				
Golf (green coil)	20 mA	20 mA	20 mA	20 mA
"B" (white wires)	25 mA	25 mA	25 mA	25 mA
"DV" (black wires)	15 mA	15 mA	15 mA	15 mA
Hybrid system max number of interfaces per system (LDI, SDI, MDI)	8	3	2	1

<sup>1</sup>Has LSP-1 surge protection built-in.

<sup>2</sup>A wire path is the leg coming off the LDI, SDI or LTB.

<sup>3</sup>The number of decoders on a large system with long wire runs may reduce the number of active decoders that you will be able to operate at one time before the interface maximum current draw is exceeded and the interface shuts down (disconnects from the field wiring).

<sup>4</sup>Although the MDI and LDI can handle a maximum of 500 decoder addresses total. With any number over 380, the number of active decoders you will be able to operate simultaneously may be reduced.

<sup>5</sup>Although the SDI can supply 500 mA, to allow some safety factor, design to 450 mA.

5 Ohms or less — Most effective central control grounding grid resistance.  
50 Ohms or less — Most effective LSP-1 grounding grid resistance.

### BASIC DATA FOR DECODER SYSTEM DESIGN

THE BASIC DATA FOR A DECODER SYSTEM IS AS FOLLOWS:

500 maximum <sup>4</sup>	Decoder addresses per MDI/LDI interface unit
200 maximum	Decoder addresses per SDI interface unit
40 maximum	Active solenoids per LDI or MDI (with 20 mA current draw each)
15 maximum	Active solenoids per SDI (with 20 mA current draw each)
20 maximum	Active solenoids per two-wire path on LDI or MDI (with 20 mA current draw each)
15 maximum	Active solenoids per two-wire path on SDI (with 20 mA draw current each)
9 Volts	Maximum allowable voltage drop per two-wire path
15 mA (total) <sup>5</sup>	For LDI or SDI Lights
0.5 mA each	For each inactive FD-101 or FD-102 decoder
1.0 mA each	For each inactive FD-401, FD-202 or FD-601 decoder
15 mA each	For each active DV solenoid coil with black wires
20 mA each	For each active Golf (green) solenoid coil
25 mA each	For each active B solenoid coil with white wires
LSP-1 Installation	No more than 8 decoders between two LSP-1 surge arrestors or no more than 500 ft., whichever is less. LSP-1 ground grid resistance of 50 Ohms or less is recommended.

### MAXIMUM WIRE LENGTHS FOR SECONDARY PATH WIRE RUNS

Wire Size	SECONDARY WIRE RUN LENGTHS	
	Meters	Feet
1.5 mm <sup>2</sup>	100	328
2.0 mm <sup>2</sup>	133	436
2.5 mm <sup>2</sup>	166	545
16.0 AWG	88	289
14.0 AWG	139	456
12.0 AWG	220	720