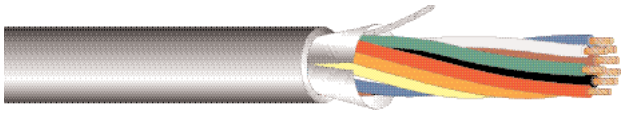


West Penn Wire

Access Control Systems and Cables



Access Control Cables

CARD READER CABLES					
AWG Size	# of Cond.	CMR Shielded	CMP Shielded	CMR Unshielded	CMP Unshielded
22	4	3241	253241B	241	25241B
22	6	3270	253270B	270	25270B
22	8	3271	253271B	271	25271B
22	10	3272	253272B	272	25272B
22	15	3274	253274B	274	25274B
18	4	3244	253244B	242	25242B
18	6	3021	253186B	--	25186B
18	8	--	253188B	--	25188B
ACCESSORY ACCESS CONTROL CABLES					
AWG Size	# of Cond.	CMR Unshielded	CMP Unshielded	APPLICATIONS	
22	2	221	25221B	Door Contact	
22	4	241	25241B	Request to Exit	
18	2	224	25224B	Lock Power	
18	4	244	25244B	Accessory Cable	
RS-485 DATA CABLES					
AWG Size	# of Pairs	CMR Shielded	CMP Shielded	APPLICATIONS	
RS-485 Data Systems Braid/Foil Construction					
24	1	D4851	D254851	RS-485 Data Systems	
24	2	D4852	D254852	RS-485 Data Systems	
24	3	D4853	--	RS-485 Data Systems	
24	4	D4854	--	RS-485 Data Systems	
RS-485 Data Systems Foil Construction					
24	1	D2401	D252401	RS-485 Data Systems	
24	2	D2402	D252402	RS-485 Data Systems	

ACCESS CONTROL SYSTEMS:

An access control system is an integration of hardware, software, and management tools that electronically monitor and control access through door, gates, elevators, and many other entry points.

Access control systems are found virtually everywhere. They can be found in Hotels, Hospitals, Airports, Banks, Prisons, Military facilities, Social Clubs, Residential Complexes, Libraries, Factories, and many other places where access security is a premium.

The Access Control Systems of today are becoming more sophisticated. Many other security applications are being integrated with the Access control system to make it a complete security system. Some security systems being integrated are: • CCTV • Intrusion detection • HVAC • Time & attendance reporting.

READER TECHNOLOGY:

There are many choices in reader (reader) technology, the most common technologies for card access controls are:

- Bar Code
- Magnetic stripe - One of the most popular
- Wiegand
- Proximity - One of the most popular

BAR CODE:

Bar code is very common in non-security applications but it seldom is the technology of choice for security and access control.

MAGNETIC STRIPE:

Magnetic stripe is the most widely used technology worldwide for access control applications. Most people are familiar with the technology because of its wide spread use by bank and credit card operations. This technology only provides medium security level because it is possible to duplicate cards. But because of the low cost of the cards and readers this technology is an attractive choice for many applications.

WIEGAND:

Wiegand was originally created to provide a permanently encoded card when magnetic stripe cards were so sensitive to magnetic fields. This technology was the most common choice for high security applications before the advent of lower cost proximity technology, and high density magnetic stripe.

PROXIMITY:

Proximity is the fastest growing technology for card access control applications. The proximity technology reader constantly transmits a low-level fixed RF signal that provides energy to the card. When the card is held at a certain distance from the reader, the RF signal is absorbed by the card which contains a unique identification code. The main advantage is there is no wear, no slots, no moving parts, and no read heads to maintain. Proximity technology is based on a frequency of 125KHZ, which has a longer read-range than smart card technology.

ACCESS CONTROL SYSTEMS: OTHER TECHNOLOGIES:

SMART CARD: Smart cards are one of the latest additions to the world of access control. The smart cards can be contact or contactless cards and come in two varieties: memory and microprocessor. Contactless Smart cards, also known as Mifare, work on the premise of Radio Frequency Identification (RFID). A frequency of 13.56MHz has been designated for use in technology.

BUTTON : This technology takes a computer chip and places it inside a small metal enclosure. Each button has a unique and unalterable address. The electronic communication interface can be worn on a watch, keychain, a pin, or ring.

BIOMETRICS: Biometrics technology verifies or identifies a person based on physical characteristics. A biometric system uses hardware readers to capture the biometric information, and software to maintain and manage it.

Types of biometric readers:

- Finger scan- Most popular
- Iris & Retina- Highly accurate
- Hand Geometry
- Face scan • Voice & Signature

KEYPADS: Keypads are simply a pad with numbered combinations for access. In areas with high security, an entry point will be equipped with multiple reader technologies.

Access Control Cable Design:

Card Reader Cables: Pages 9-10

Conductor:- Between 18-22 AWG Stranded Bare Copper
Solid Conductors can be used.

Insulation: PVC insulation is used primarily. A lower capacitance cable is not normally needed for Proximity, and Wiegand Readers. Some readers may require lower capacitance cables. If this is the case, our D-Series cables may be used. D3653.

Shield: Most Card Reader cables require a 100% Aluminum Foil Shield. There are some systems that do not require a shield-
Some may require a Foil + a Braid Coverage

Jacket: Environmental dependent- Riser, Plenum, Indoor/Outdoor, Outdoor.

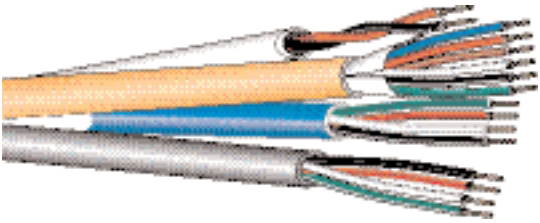
Auxiliary cables: Pages- 2-6

Door Contact- 2 Conductor 18 AWG. Example: 224

Lock Power- 4 Conductor 18 AWG. Example: 244

Egress-REX- 4 Conductor 22 AWG. Example: 241

These cables do not require a foil shield



Access Control Cable Design:

Composite Design Lickity Split: Page 185

Combination of Reader, Card Reader, Lock/Power, and REX cables in one cable.

Jacket Version P.N. - LS1822, LS251822

Lickity Split Versions P.N. -

AC1822, AC251822B, AC251822B3P

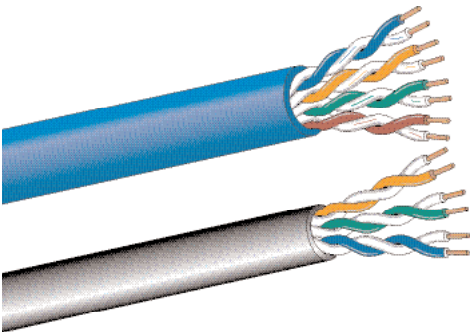


Communication Cables: Pages 109-115

Description:- 22 or 24 AWG. Bare or Tinned Copper.
Low capacitance cable- Better insulation material.

RS-485- P.N. Example: D4851, D2401

Networking Cables - P.N. Example: 4245



Access Control Cables

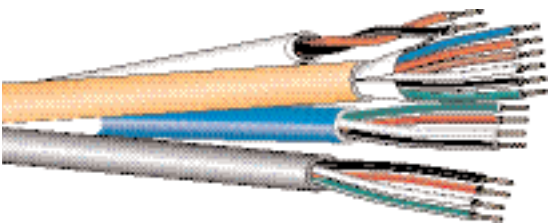
Lickity Split Bondled Cables, a new concept for quick, easy, and efficient installation of composite cables. The novel construction offers an intermittently internal bonded and bundled design that we like to call **Bondled**. The bonding is done internally every 4 to 7 inches, depending on the cable grouping.

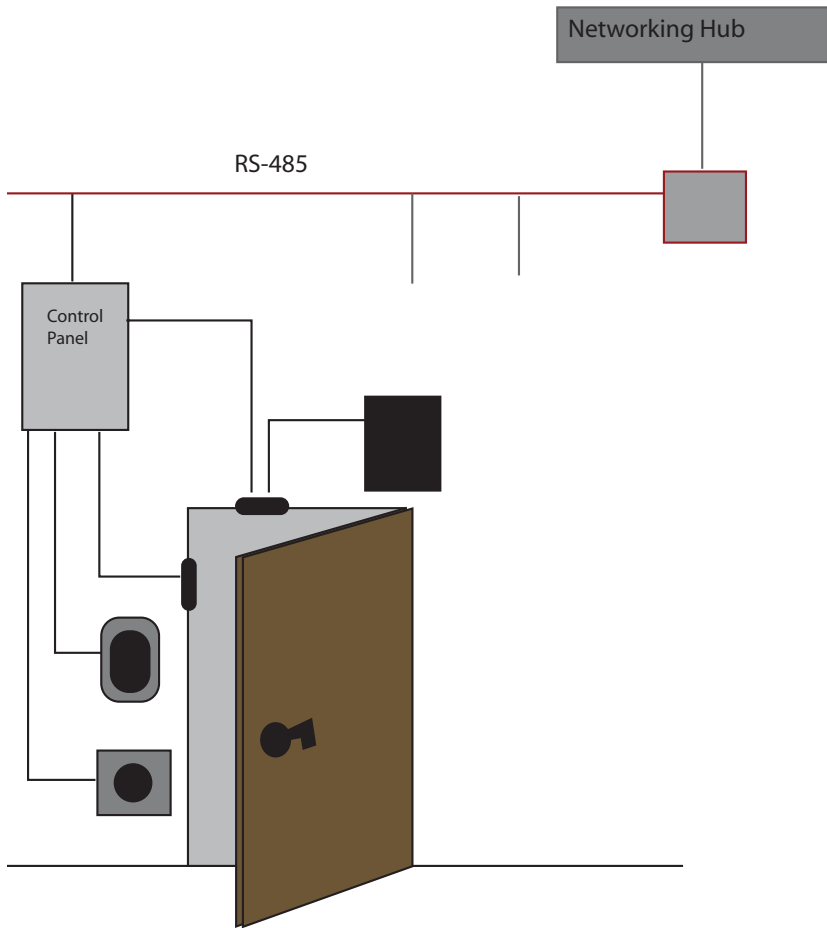
Jacketed composite cables are larger and more difficult to terminate. The **Lickity Split Bondled Cables** offer the advantage of easier, faster termination time, as well as a smaller cable profile.

Bound Cables are composite cables combined within a helical wrap that offer the advantage of a small profile, and a lower cost, but with the wrap the cable may get snagged or caught by burrs during installation. The **Lickity Split Bondled Cables** offer the same advantages as the bound cables, but because of its cabled construction and **Bondled** design, the cable can be installed and terminated in a "lickity split".

Other continuous internally bonded cables do not offer the quick termination time of the **Lickity Split Bondled Cable design**.

Catalog No.	Construction	Description
LS1822 CMR	4 cables Bondled together	Cable 1 Door Contact 2 Conductor 22 AWG (7x30) Bare Copper Cable 2 Request to Exit 4 Conductor 22 AWG (7x30) Bare Copper Cable 3 Reader Cable 6 Conductor 22 AWG (7x30) Shielded Bare Copper Cable 4 Lock Power 4 Conductor 18 AWG (7x26) Bare Copper
Catalog No.	Construction	Description
LS251822 CMP	4 cables Bondled together	Cable 1 Door Contact 2 Conductor 22 AWG (7x30) Bare Copper Cable 2 Request to Exit 4 Conductor 22 AWG (7x30) Bare Copper Cable 3 Reader Cable 6 Conductor 22 AWG (7x30) Shielded Bare Copper Cable 4 Lock Power 4 Conductor 18 AWG (7x26) Bare Copper





Reader Cables:
Wiegand/ Proximity:
 270, 3270, 3652

Door Contact:
 224, 225

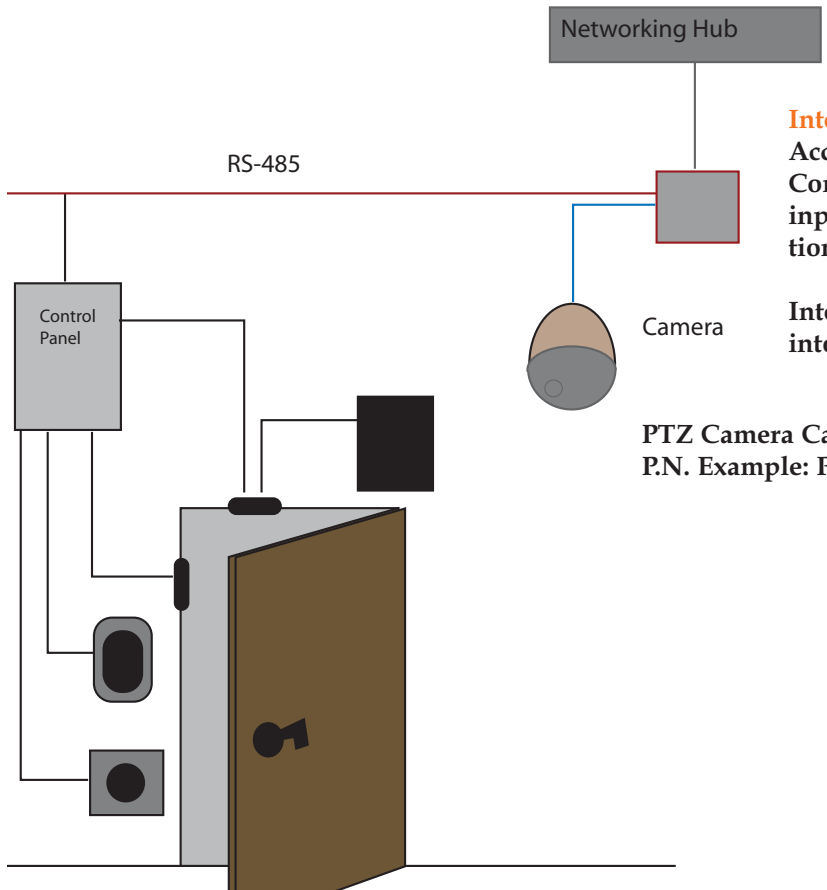
REX- Egress:
 241, 244, 3244

Lock/Power:
 244, 3244

RS-485:
 D4851, D2401

Network:
 4245, 4246

All in One Cable:
 AC1822B

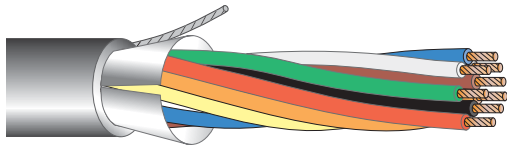


Integrated Design:
 Access Control with CCTV
 Control-Networking Panel will have alarm inputs for a camera to PTZ to a preset location when alarm contact is signaled.

Intercom and Fire Alarm can be integrated into the Access Control System.

PTZ Camera Cables:
 P.N. Example: PTZ825

Shielded Reader Cables



Communication & Control Cable 22 AWG Multiple Conductor / Overall Shielded featuring the PERFECT STRIPE®

Applications:

Indoor for:

- Intercom Systems
- Security Systems
- Sound and Audio
- Background Music
- Power-limited Control Circuits
- Card Reader Cables - Access Control

Description:

- ASTM Bare Copper • PVC insulation • Overall shield 100% coverage of aluminum polyester foil with 24 AWG Strd. TC drain wire • Cabled construction • Overall PVC jacket

Rating:

- NEC Type CMR
- (UL)-C(UL) Listed
- Meets 300V requirements as specified in the NEC
- Flame Rating: UL1666

Standard pool size 1000ft.

Catalog No.	No. of Cond.	Conductor Type & Nom. D.C.R	Insulation Type & Thickness Inches	Shielding & % Coverage	Jacket Type & Thickness Inches	Nom. O.D. Inches	NEC Type	Nom. Capacitance	Jacket Color
3241	4	22 AWG (7x30) 17 Ω/Mft	PVC .007	Al. Foil 100%	PVC .017	.142	CMR	55 pf/ft* 99 pf/ft**	Gray
3855	5	22 AWG (7x30) 17 Ω/Mft	PVC .007	Al. Foil 100%	PVC .017	.154	CMR	55 pf/ft* 99 pf/ft**	Gray
3270	6	22 AWG (7x30) 17 Ω/Mft	PVC .007	Al. Foil 100%	PVC .017	.167	CMR	55 pf/ft* 99 pf/ft**	Gray
3271	8	22 AWG (7x30) 17 Ω/Mft	PVC .007	Al. Foil 100%	PVC .017	.182	CMR	55 pf/ft* 99 pf/ft**	Gray
3272	10	22 AWG (7x30) 17 Ω/Mft	PVC .007	Al. Foil 100%	PVC .017	.222	CMR	55 pf/ft* 99 pf/ft**	Gray
3274	15	22 AWG (7x30) 17 Ω/Mft	PVC .007	Al. Foil 100%	PVC .020	.255	CMR	55 pf/ft* 99 pf/ft**	Gray

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Color Code

Colors	Colors	Colors
1. Black	8. Yellow	15. White/Green
2. Red	9. Purple	
3. White	10. Gray	
4. Green	11. Pink	
5. Brown	12. Tan	
6. Blue	13. White/Black*	
7. Orange	14. White/ Red	
JACKET: Gray		
*Conductors 13 and above have PERFECT STRIPE®		

* Capacitance between conductors.

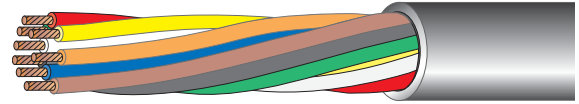
** Capacitance between one conductor and the other connected to the shield

Special Notes:

- Selected Plenum Versions see pages 33
- Cables are packaged in our Advantage Box. Larger AWG sized cables and Higher Paired cables may be on a reel.
- Orange Rip Cord

Unshielded Reader Cables

Communication & Control Cable
Multiple Conductor 22 AWG / Unshielded
featuring the PERFECT STRIPE®



Applications:

Indoor for:

- Intercom Systems
- Security Systems
- Sound and Audio
- Background Music
- Power-limited Control Circuits

Description:

- ASTM Bare Copper • PVC insulation • Cabled construction • Overall PVC jacket

Rating:

- NEC Type CMR
- (UL)-C(UL) Listed
- Meets 300V requirements as specified in the NEC
- Flame Rating: UL1666

Standard spool size 1000ft.

Catalog No.	No. of Cond.	Conductor Type & Nom. D.C.R	Insulation Type & Thickness Inches	Shielding	Jacket Type & Thickness Inches	Nom. O.D. Inches	NEC Type	Nom. Capacitance	Jacket Color
855	5	22 AWG (7x30) 17 Ω/Mft	PVC .007	None	PVC .017	.150	CMR	--	Gray
270	6	22 AWG (7x30) 17 Ω/Mft	PVC .007	None	PVC .017	.163	CMR	--	Gray
271	8	22 AWG (7x30) 17 Ω/Mft	PVC .007	None	PVC .017	.176	CMR	--	Gray
272	10	22 AWG (7x30) 17 Ω/Mft	PVC .007	None	PVC .017	.218	CMR	--	Gray
274	15	22 AWG (7x30) 17 Ω/Mft	PVC .007	None	PVC .017	.251	CMR	--	Gray

Special Notes:

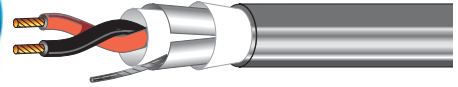
- Cables are packaged in our Advantage Box. Larger AWG sized cables and Higher Paired cables may be on a reel.
- Orange ripcord under jacket

Color Code		
Colors	Colors	Colors
1. Black	8. Yellow	15. White/Green
2. Red	9. Purple	
3. White	10. Gray	
4. Green	11. Pink	
5. Brown	12. Tan	
6. Blue	13. White/Black*	
7. Orange	14.. White/ Red	
JACKET: Gray		
*Conductors 13 and above have PERFECT STRIPE®		

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Aquaseal Reader Cables

Aquaseal® Water Blocking Cable Two & Multiple Conductor / Shielded



Applications:

Indoor/Outdoor Use:

- Intercom Systems
- Reader Cables

Description:

- ASTM Bare Copper • PVC insulation • Short overall twist lengths
- Overall shield 100% coverage of aluminum polyester foil with drain wire • Waterblocked construction • Overall Sunlight/ Moisture Resistant PVC jacket

Rating:

- NEC Type CM or CL3
- (UL) Listed
- Meets 300V requirements as specified in the NEC
- Flame Rating: UL1685

Place in Conduit - Outside

Standard spool size 1000ft.

Catalog No.	No. of Cond.	Conductor Type & Nom. D.C.R	Insulation	Shielding	Jacket Type &	Nom. O.D. Inches	NEC Type	Nom. Capacitance	Jacket Color
			Type & Thickness Inches	% Coverage Drain Wire	Thickness Inches				
AQC3186	6 Cond.	18 AWG (7x26) 6.2 Ω/Mft	PVC .008	Al. Foil-100% 24 Strd.	PVC .025	.323	CM CL3	68 pf/ft* 122 pf/ft**	Gray
AQC3283	12 Cond.	18 AWG (7x26) 6.2 Ω/Mft	PVC .008	Al. Foil-100% 24 Strd.	PVC .025	.410	CM CL3	68 pf/ft* 122 pf/ft**	Gray

* Capacitance between conductors.

** Capacitance between one conductor and the other connected to the shield

Color Code			
Catalog No.		AQC3186, AQC3274, AQC3283	
Primary Color Code		1. Black, 2. Red, 3. White, 4. Green, 5. Brown, 6. Blue, 7. Orange, 8. Yellow, 9. Purple, 10. Gray, 11. Pink, 12. Tan, 13. White/Black, 14. White/Red, 15. White/Green	
		JACKET: Gray Conductors 13 and above have PERFECT STRIPE®	

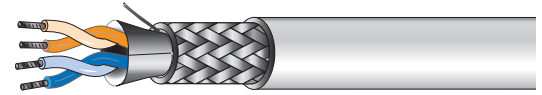
Special Notes:

- Aquaseal Water Resistant Cables is a Registered Trademark of West Penn Wire
- Select Items are Packaged in our Advantage Box
- Orange ripcord under jacket

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Serial Data Grade Cable

Data Grade Cable Multiple Pair Series / Overall Shielded RS-485 Data Cables



Applications:

Indoor for:

- Computer Application
- Low Capacitance Data
- RS-485 Data Applications

Description:

- ASTM Tinned Copper • Polyolefin Insulation • Twisted pair construction • Polyester wrap • Overall shield 100% coverage of aluminum polyester foil with 24 Awg. Stranded drain wire
- 90% Tinned Copper Braid • Overall PVC Jacket

Rating:

- NEC Type CM
- (UL) Listed
- Meets 300V requirements as specified in the NEC
- Flame Rating: UL1685

Standard spool size 1000ft.

Catalog No.	No. of Pairs	Conductor Type & Nom. D.C.R.	Insulation Type & Thickness Inches	Shielding & Coverage	Jacket Type & Thickness Inches	Nom. O.D. Inches	NEC Type	Nom. Capacitance	Jacket Color
D4851	1	24 AWG (7x32) 26 Ω/Mft	Polyolefin .020	Al. Foil-100% with drain wire TC Braid 90%	PVC .032	.275	CM	12.8 pf/ft* 23 pf/ft**	Gray
D4852	2	24 AWG (7x32) 26 Ω/Mft	Polyolefin .020	Al. Foil-100% with drain wire TC Braid 90%	PVC .032	.305	CM	12.8 pf/ft* 23 pf/ft**	Gray
D4853	3	24 AWG (7x32) 26 Ω/Mft	Polyolefin .020	Al. Foil-100% with drain wire TC Braid 90%	PVC .032	.320	CM	12.8 pf/ft* 23 pf/ft**	Gray
D4854	4	24 AWG (7x32) 26 Ω/Mft	Polyolefin .020	Al. Foil-100% with drain wire TC Braid 90%	PVC .032	.345	CM	12.8 pf/ft* 23 pf/ft**	Gray

Color Code	
Pair No.	Colors
1	Blue- White
2	Orange- White
3	Green- White
4	Brown- White
JACKET: Gray	

Electrical Characteristics
Nom. Vel of Propagation - 66%
Nom. Impedance Ω 24 Awg.- 120Ω

- * Capacitance between conductors.
- ** Capacitance between one conductor and the other connected to the shield

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Lickity Split Bondled Cables

Lickity Split Bondled Cables, a new concept for quick, easy, and efficient installation of composite cables. The novel construction offers an intermittently internal bonded and bundled design that we like to call **Bondled**. The bonding is done internally every 4 to 7 inches, depending on the cable grouping.

Jacketed composite cables are larger and more difficult to terminate. The **Lickity Split Bondled Cables** offer the advantage of easier, faster termination time, as well as a smaller cable profile.

Bound Cables are composite cables combined within a helical wrap that offer the advantage of a small profile, and a lower cost, but with the wrap the cable may get snagged or caught by burrs during installation. The **Lickity Split Bondled Cables** offer the same advantages as the bound cables, but because of its cabled construction and **Bondled** design, the cable can be installed and terminated in a "lickity split".

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WEST PENN WIRE

2833 West Chestnut Street
Washington, Pa 15301

• **800-245-4964** Toll Free

• 724-222-6420 fax

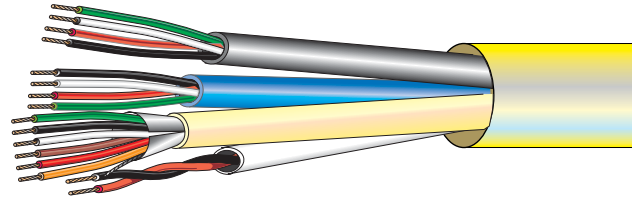
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All in One Access Control

Composite Access Control Cables

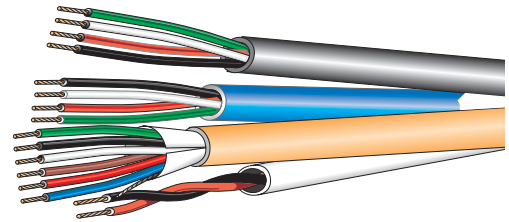
Applications:

- Access Control Systems



Standard pool size 1000ft.

Catalog No.	Cable Types	Application	NEC Type	Nom. Jacket O.D. & Color
AC1822	2 Cond 22 AWG 4 Cond. 18 AWG 4 Cond. 22 AWG	Door Contact Lock Power Request to Exit Card Reader	CM	.440"
	6 Cond. 22 AWG Shielded			Overall PVC Jacket Blue
AC251822B	2 Cond 22 AWG 4 Cond. 18 AWG 4 Cond. 22 AWG	Door Contact Lock Power Request to Exit Card Reader	CMP	.440"
	6 Cond. 22 AWG Shielded			Overall Plenum PVC Jacket Yellow
AC251822B3P	2 Cond 22 AWG 4 Cond. 18 AWG 4 Cond. 22 AWG	Door Contact Lock Power Request to Exit Card Reader	CMP	.440"
	3 Pair 22 AWG Shielded			Overall Plenum PVC Jacket Yellow



Standard pool size 1000ft.

LS1822	2 Cond 22 AWG 4 Cond. 18 AWG 4 Cond. 22 AWG 6 Cond. 22 AWG Shielded	Door Contact Lock Power Request to Exit Card Reader	CM	.430" Unjacketed Lickity Split Bonded Cable
LS251822	2 Cond 22 AWG 4 Cond. 18 AWG 4 Cond. 22 AWG 6 Cond. 22 AWG Shielded	Door Contact Lock Power Request to Exit Card Reader	CMP	.430" Unjacketed Lickity Split Bonded Cable

Cable Types	Conductor Colors	Jacket Colors
Door Contact	1. Black, 2. Red	White
Lock Power	1. Black, 2. Red, 3. White, 4. Green	Gray
Request to Exit	1. Black, 2. Red, 3. White, 4. Green	Blue
Card Reader	1. Black, 2. Red, 3. White, 4. Green 5. Brown, 6. Blue	Orange



Notes:

Standard Spool size 1000ft, spools are one piece, but lengths may vary +/- 10%
 PE- Polyethylene
 Bifoil is an aluminum polyester aluminum tape with 100% coverage
 100% Sweep Tested