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BSR E1.80 - 202x

Pinout Configuration Types for Special-Purpose Multicircuit Cable Systems

Approved by the ANSI Board of Standards Review as an American National Standard on _____

EP/2024-7004r1

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Observer (non-voting) members:

[This is a placeholder for the EPWG Observer members]

Interest category codes:

CP = custom-market producer	DE = designer
DR = dealer rental company	G = general interest
MP = mass-market producer	U = user

Table of Contents

Introduction

The use of Special-Purpose Multicircuit Cable Systems has been a critical part of electrical power distribution in the event and entertainment industries across North America for decades. These systems provide an efficient method for distributing many individual electrical circuits in a wide variety of applications from live concerts to performing-arts venues, as well as in film, video, and broadcast production.

A significant majority of 6-circuit, 19-pin, 120 volt Special-Purpose Multicircuit Cable Systems in North America use the pinout configuration of the USITT Recommended Practice RP-1 published in 1997 by the United States Institute for Theatre Technology[1].

The globalization of the event and entertainment industries and the proliferation of automated lights and LED displays have significantly increased the use of Special-Purpose Multicircuit Cable Systems carrying nominal voltages above 120 volts. No standard or recommended practice has existed in North America for such systems, which has resulted in a variety of incompatible pinout configurations for the same 19-pin connector. Cross-mating of incompatible pinout configurations can create an electrical hazard with potentially detrimental consequences for personnel and equipment.

Changes proposed to the National Electrical Code for the 2026 Edition in Section 520.68(D) will add requirements to the code for marking of voltage and pinout configuration types when Special-Purpose Multicircuit Cable Systems are deployed. The proposed Informational Note in this section for the 2026 Edition of NEC provides a reference to *[this standard]* E1.80. This standard offers pinout configuration type designations and specifications to help fulfill the NEC marking requirements.

Published standards for 19-pin pinout configurations already existed in continental Europe, DIN15765[2], and the UK, BS7909[3], prior to the development of this standard. BS7909 Annex H included configurations that are in common use in North America. Both standards are referenced in this document and care has been taken to coordinate type designations with these two standards to avoid confusion.

This standard is intended to accommodate revisions and expansions in future editions as new technologies or different cable systems become relevant.

1 USITT Recommended Practice RP-1. *Contact function assignment for multi-circuit circular pin connectors used for the distribution of multiple lighting circuits. 19-contact (Six-circuit) Connector.* ©1997 United States Institute for Theatre Technology, Inc.

2 DIN 15765. *Multi-core cable systems for mobile productions and entertainment technology.*
English translation of DIN 15765:2020-11, *Table 3, No. 7, Power class / type, 2 + 3/d.*

3 BS 7909:2023, *Temporary electrical systems for entertainment and related purposes.*
Annex H (informative) Multi-pole connectors used for lighting and other applications.
H.8 19-pole circular connector systems.
Table H.3 – Circular 19-pole connector wiring configurations.
Table H.4 – Common circular 19-pole connector wiring configuration by country and manufacturer.

1 Scope

1.1 This standard covers commonly used 6-circuit, 19-pin, Socapex SL419 compatible, Special-Purpose Multicircuit Cable Systems deployed in stage, studio, and event applications.

1.2 The following systems and applications are outside the scope of this standard:

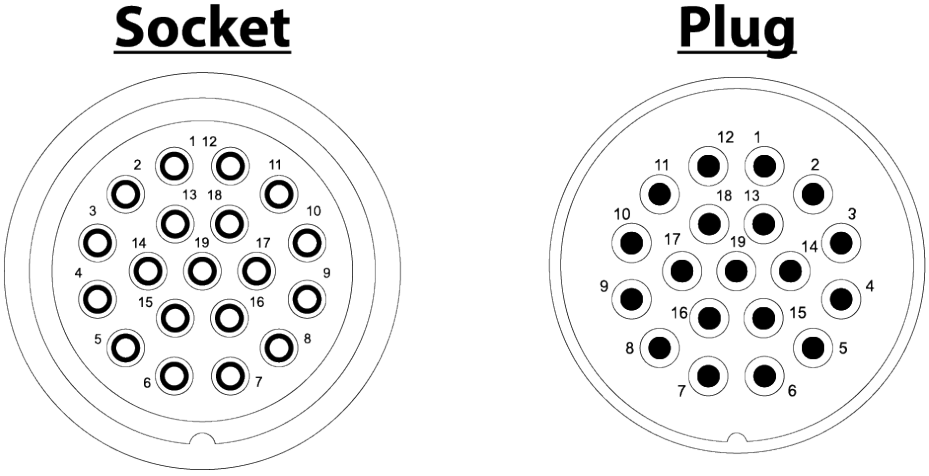
- 12-circuit, 37-pin cable systems found in USITT RP-1.
- 8-circuit, 19-pin cable systems.
- 7 and 14-pin chain hoist cable systems found in ANSI E1.6-5 (current published version).
- 3-pin HMI power cables found in ANSI E1.16 (current published version).
- Audio applications.
- Motor control applications.
- Other types of multicircuit cable systems.

1.3 Grounding and bonding of grounding conductors, except for the assignment of grounding pins in the multicircuit connectors, are outside the scope of this standard.

A variety of grounding practices exist in the industry and care should be taken to ensure safe and regulatory compliant ground continuity in deployed systems.

2 Figures and tables

Figure 1: Pin numbering and their positions in the connector.



19 pin, Socapex SL419-compatible, connectors seen from the mating side

TABLE 1 NORTH AMERICA

Pin	120V TYPE U USITT RP-1		208V TYPE C BS7909 C		240V TYPE C Derivative of 208V TYPE C		208V TYPE D BS7909 D (Soldered)		208V TYPE E BS7909 E (Cable)	
	CIRCUIT	L/N/G	CIRCUIT	L/N/G	CIRCUIT	L/N/G	CIRCUIT	L/N/G	CIRCUIT	L/N/G
1	1	L	1	L	1	L	1	L1	1	L1
2	1	N	1	L	1	L	2	L1	2	L1
3	2	L	2	L	2	L	3	L2	1	L2
4	2	N	2	L	2	L	1	L2	2	L2
5	3	L	3	L	3	L	2	L3	3	L3
6	3	N	3	L	3	L	3	L3	4	L3
7	4	L	4	L	4	L	4	L1	3	L1
8	4	N	4	L	4	L	5	L1	4	L1
9	5	L	5	L	5	L	6	L2	5	L2
10	5	N	5	L	5	L	4	L2	6	L2
11	6	L	6	L	6	L	5	L3	5	L3
12	6	N	6	L	6	L	6	L3	6	L3
13	G1	G	G1	G	G1	G	G1	G	G1	G
14	G2	G	G2	G	G2	G	G2	G	G2	G
15	G3	G	G3	G	G3	G	G3	G	G3	G
16	G4	G	G4	G	G4	G	G4	G	G4	G
17	G5	G	G5	G	G5	G	G5	G	G5	G
18	G6	G	G6	G	G6	G	G6	G	G6	G
19	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

TABLE 2 EUROPE

230V TYPE A BS7909 A DIN15765		
CIRCUIT	L/N/G	Pin
1	L	1
1	N	2
2	L	3
2	N	4
3	L	5
3	N	6
4	L	7
4	N	8
5	L	9
5	N	10
6	L	11
6	N	12
G1	G	13
G2	G	14
G3	G	15
G4	G	16
G5	G	17
G6	G	18
NC	NC	19

Table Key:
L = Ungrounded Circuit Conductor; commonly known as “Hot” or “Phase”.
N = Grounded Circuit Conductor; commonly known as “Neutral”.
NC = no connection
G = Grounding Conductor; commonly known as “Ground” in North America and “Earth” in Europe.
120V Type U North American pinout configuration originated by USITT RP-1.
208V Type C North American pinout configuration also found in BS7909 Annex H as Type C.
240V Type C North American pinout configuration - a voltage derivative of 208V TYPE C.
208V Type D North American pinout configuration also found in BS7909 Annex H as Type D.
208V Type E North American pinout configuration also found in BS7909 Annex H as Type E.
230V Type A European pinout configuration found in BS7909 Annex H as Type A and DIN15765 Table 3 No 7.

3 Marking

When deployed, each multicircuit, multipole connector that is part of a Special-Purpose Multicircuit Cable System shall be clearly marked with voltage, a reference to *[this standard]* E1.80, and the type designation.

Examples:

120V *[this standard]* E1.80 Type U

208V *[this standard]* E1.80 Type C

240V *[this standard]* E1.80 Type C