ModICE®

Industrial and Commercial Transportation

cinch
CONNECTIVITY SOLUTIONS
a bel group

belfuse.com/cinch

About Bel

Bel is a publicly traded company that has been operated by the same family for over 65 years. Our history of organic growth and acquisitions have broadened our product portfolio. This has established Bel as a world leader with a diverse offering of power, protection and interconnect products. We design and manufacture these products which are primarily used in the networking, telecommunications, computing, military, aerospace, transportation and broadcasting industries. Bel's portfolio of products also finds application in the automotive, medical and consumer electronics markets.

About ModICE®

ModICE® is a complete line of connector enclosures that offer sealed packaging solutions for rugged electronic control modules. The Cinch 1.5mm SHS system is the base interconnect technology. SHS is a complete line of sealed rugged I/O connectors. This product family is designed to perform on electronic control modules that function in extreme environmental conditions commonly found on commercial and off-road vehicles and industrial equipment.

Table of Contents

The ModICE® Advantage

mini-ME Enclosure

SE Enclosure with Vent

LE Enclosure
(PCB not provided by Cinch)

ME-RF Enclosure

ME Enclosure

Product Highlights

- 4 distinct enclosure sizes (ME, SE, LE and mini-ME)
- Multiple header configurations (18, 30, 48 and 60 I/O)
- Simple module assembly with snap-in header/PCB

Available Options

- ME header with integrated RF Ports (SMA, RP-SMA)
- Headers with integrated ferrite filtering
- Blank headers for specific customer applications
- Enclosures with integrated heat sink (SE and LE)
- Vented enclosures (breather vent)

Environmental

Operating Temperature	-40°F to +185°F (-40°C to +85°C)
Sealing	IP67, IP69K
Temperature Life	1000 hours @ 85°C
Salt Spray	96 hours
Temperature Humidity Cycling	320 hours (40 – 8 hours cycle) -40°F to +185°F (-40°C to +85°C)
Fluid Resistance	Resists to most fluids used in industrial applications

Electrical

Current	10 Amp @ 185°F (+85°C)
Insulation Resistance	>1000mΩ
Current Cycling	500 hours @ 10 Amp, 500 cycles 45 min ON, 15 min OFF

Mechanical

Contact Resistance	<10mΩ
Vibration	10 to 2000 to 10Hz with 15 g-forces* peak level
Shock	50 g-forces*, 20 pulses

**A g-force of 1 g equal to the conventional value of gravitational acceleration on Earth, g, of about 9.8 m/s 2.*

Enclosures

mini-ME

	Enclosure	With Breather
Without heat sink	581 01 30 090	581 01 30 095

ME

	Enclosure	With Breather
Without heat sink	581 01 30 065	581 01 30 075

SE

	Enclosure	With Breather
Without heat sink	581 01 30 043	581 01 30 059
With one heat sink	581 01 30 042	581 01 30 058
With two heat sinks	581 01 30 041	581 01 30 057

LE

	Enclosure	With Breather
Without heat sink	581 01 60 033	581 01 60 039
With one heat sink	581 01 60 032	581 01 60 038
With two heat sinks	581 01 60 031	581 01 60 037

SE & LE Spring Plate for Heat Sink Option*

	Spring Plates
With one heat sink	581 00 00 021
With two heat sinks	581 00 00 020 and 581 00 00 021

** The heat sink option is only available on the SE and LE enclosure*

Headers

ME


ME Header


Blank


18 I/O


30 I/O


48 I/O

SE


SE Header


Blank


18 I/O


30 I/O


48 I/O

LE


LE Header


Blank


30 I/O


48 I/O


60 I/O

ME-MX


ME-MX Header


12 I/O


20 I/O


24 I/O


32 I/O


40 I/O

ME-RF


ME-RF Header


18 I/O


30 I/O

Headers

ME

I/O	With Ferrite	Without Ferrite
18 I/O	581 01 18 039	581 01 18 038
30 I/O	581 01 30 072	581 01 30 064
48 I/O	581 01 48 010	581 01 48 009
Blank		581 00 00 055

SE

I/O	With Ferrite	Without Ferrite
18 I/O	581 01 18 033	581 01 18 032
30 I/O	581 01 30 046	581 01 30 044
48 I/O	581 01 48 007	581 01 48 005
Blank		581 00 00 027

LE

I/O	With Ferrite	Without Ferrite
30 I/O	581 01 30 051	581 01 30 045
48 I/O	581 01 48 008	581 01 48 006
60 I/O	581 01 60 006	581 01 60 005
Blank		581 00 00 028

ME-RF Headers

I/O	Left RF	Right RF	With Ferrite	Without Ferrite
18	N/A	SMA	5810618004	5810618003
18	RP-SMA	N/A	5810618006	5810618005
30	N/A	SMA	5810630004	5810630003
30	RP-SMA	N/A	5810630006	5810630005
18	RP-SMA	SMA	5810618002	5810618001
18	RP-SMA	RP-SMA	5810618008	5810618007
18	SMA	SMA	5810618010	5810618009
30	RP-SMA	SMA	5810630002	5810630001
30	RP-SMA	RP-SMA	5810630008	5810630007
30	SMA	SMA	5810630010	5810630009

See page 3 for ME enclosure part numbers

ME-MX*

I/O	Polarity	Part Number
12	12A	581 01 12 011
20	20A	581 01 20 011
24	12A + 12B	581 01 24 011
32	20A + 12B	581 01 32 011
40	20A + 20B	581 01 40 011

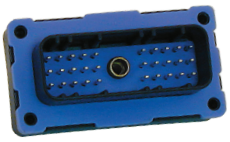
**With and without Ferrite not available with the ME-MX product line*

Tooling

ModICE® Tooling Needed for Assembly/Opening	
Tool to assemble ModICE® SE	599 11 11 687
Tool to assemble ModICE® LE	599 11 11 688
Tool to assemble ModICE® ME & ME-MX	599 11 11 652
Tool to open ModICE® SE	599 11 11 611
Tool to open ModICE® LE	599 11 11 612
Tool to open ModICE® ME & ME-MX	599 11 11 440

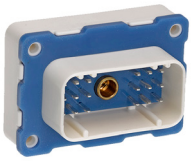
See www.belfuse.com/cinch for ModICE® assembly instructions

Headers



SHS Header 30 I/O

SHS Header 48 I/O



SHS Header 18 I/O

SHS is a complete line of sealed rugged I/O connectors. This product family is designed to perform on electronic control modules that function in extreme environmental conditions commonly found on commercial and off-road vehicles and industrial equipment.

Product Highlights

- Robust panel-mount PCB connector
- 4 header sizes (18, 30, 48 and 60 I/O)
- Integrated ferrite filtering available
- 1.5mm connector technology
- Multiple colors and keying configurations available

Environmental

Operating Temperature	-40°F to +185°F (-40°C to +85°C)
Sealing	IP67, IP69K
Temperature Life	1000 hours @ 257°F (+125°C)
Salt Spray	96 hours
Temperature Humidity Cycling	320 hours (40 – 8 hours cycle) -40°F to +185°F (-40°C to +85°C)
Fluid Resistance	Resists to most fluids used in industrial applications

Electrical

Current	10 Amp @ 185°F (+85°C)
Insulation Resistance	>1000mΩ
Current Cycling	500 hours @ 10 Amp, 500 cycles 45 min ON, 15 min OFF

Mechanical

Contact Resistance	<10mΩ
Vibration	10 to 2000 to 10Hz with 15 g-forces* peak level
Shock	50 g-forces*, 20 cycles

**A g-force of 1 g equal to the conventional value of gravitational acceleration on Earth, g, of about 9.8 m/s^2.*

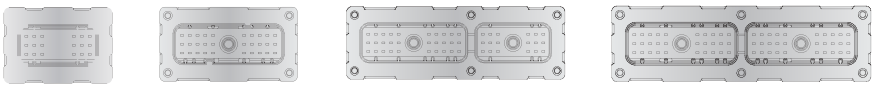
Connectors

Connectors

I/O	With Ferrite	Without Ferrite	Color
18	581 01 18 001	581 01 18 011	Black
18	581 01 18 002	581 01 18 012	Natural
30	581 01 30 001	581 01 30 011	Grey
30	581 01 30 002	581 01 30 013	Black
48	581 01 48 001	581 01 48 011	Black
48	581 01 48 002	581 01 48 012	Natural
48	581 01 48 003	581 01 48 013	Grey
60	581 01 60 001	581 01 60 011	Black
60	581 01 60 002	581 01 60 012	Natural

RoHS Compliant Connectors

I/O	With Ferrite	Without Ferrite	Color
18	781 01 18 001	781 01 18 011	Black
18	781 01 18 002	781 01 18 012	Natural
30	781 01 30 001	781 01 30 011	Grey
30	781 01 30 002	781 01 30 013	Black
48	781 01 48 001	781 01 48 011	Black
48	781 01 48 002	781 01 48 012	Natural
48	781 01 48 003	781 01 48 013	Grey
60	781 01 60 001	781 01 60 011	Black
60	781 01 60 002	781 01 60 012	Natural



18 I/O 30 I/O 48 I/O 60 I/O

For dimensions, visit belfuse.com/cinch

Harness Connectors

SHS Harness Connectors 30 I/O

SHS Harness Connectors 30 I/O

The SHS Harness Connector is the mate to ModICE® and SHS Headers.

Product Highlights

- 2 connector sizes (18, 30 way)
- 1.5mm terminal technology
- Push-to-seat terminals
- Integrated wire grommet seals with protective back-plate
- Terminal position assurance
- Robust jack-post mating to the header

Environmental

Operating Temperature	-40°F to +185°F (-40°C to +85°C)
Sealing	IP67, IP69K
Temperature Life	1000 hours @ 257°F (+125°C)
Salt Spray	96 hours
Temperature Humidity Cycling	320 hours (40 – 8 hours cycle) -40°F to +185°F (-40°C to +85°C)
Fluid Resistance	Resists to most fluids used in industrial applications

Electrical

Current	10 Amp @ 185°F (+85°C)
Insulation Resistance	>1000mΩ
Current Cycling	500 hours @ 10 Amp, 500 cycles 45 min ON, 15 min OFF

Mechanical

Contact Resistance	<10mΩ
Vibration	10 to 2000 to 10Hz with 15 g-forces** peak level
Shock	50 g-forces**, 20 cycles

**RoHS compliant*

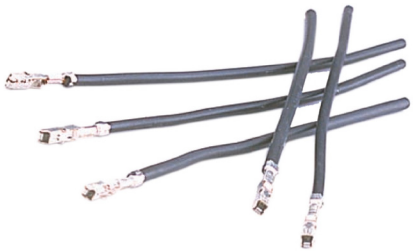
***A g-force of 1 g equal to the conventional value of gravitational acceleration on Earth, g, of about 9.8 m/s².*

Harness Connectors

Harness Connectors

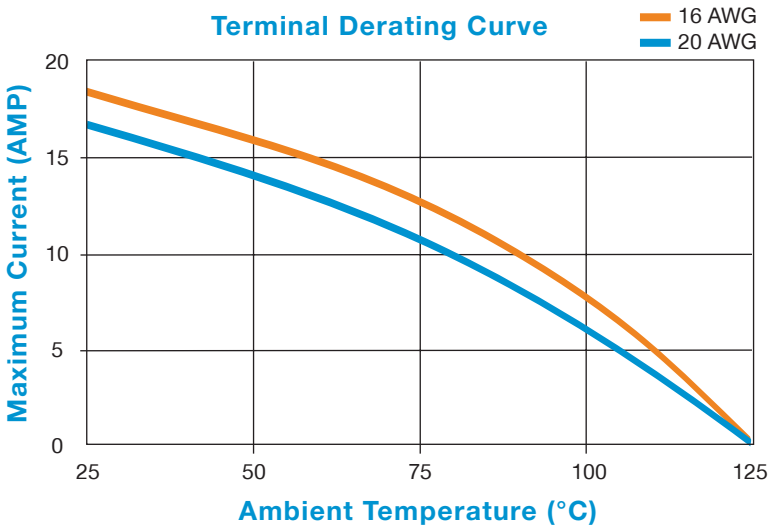
I/O	Part Number	Color
18	581 01 18 023	Black
18	581 01 18 024	Natural
30	581 01 30 027	Grey
30	581 01 30 028	Black
30	581 01 30 029	Black
30	581 01 30 030	Natural
30	581 01 30 031	Natural

See pages 12 for ModICE® Header/SHS Harness Connector, Tooling and Mating Matrix



Terminals

Wire Size	Part Number
20GXL, 18TXL	425 00 00 872
18GXL, 16TXL, 16GXL	425 00 00 873



Seal Plug

	Part Number
For connector 18 & 30 I/O	581 00 00 011

Tooling

SHS Harness Connector Repair Tooling		
599 11 11 628	Secondary lock removal tool (tweezer)	For connector 18 & 30 positions
599 01 18 920	Terminal removal tool	For connector 18 & 30 positions

SHS Harness Connector Crimp Tooling		
599 11 11 615	Hand crimp tool	For terminal 425 00 00 872
599 11 11 616	Hand crimp tool	For terminal 425 00 00 873
599 11 11 621	Applicator	For terminal 425 00 00 872
599 11 11 622	Applicator	For terminal 425 00 00 873
599 11 11 623	Punch/anvil kit	For terminal 425 00 00 872
599 11 11 624	Punch/anvil kit	For terminal 425 00 00 873

Crimp specification and connector assembly information is available at belfuse.com/cinch

Matrixes

ModICE® Header/SHS Harness Connector Matrix

ModICE® Header	Size	I/O	Connector Mate 1	Connector Mate 2
581 01 18 xxx	ME, SE	18	581 01 18 023	N/A
581 01 30 xxx	ME, SE	30	581 01 30 029	N/A
581 01 48 xxx	ME, SE, LE	48	581 01 18 023	581 01 30 029
581 01 60 xxx	LE	60	581 01 30 028	581 01 30 029
581 06 18 xxx	ME-RF	18	581 01 18 023	SMA
581 06 30 xxx	ME-RF	30	581 01 30 029	SMA

See pages 9-10 for SHS Harness Connectors

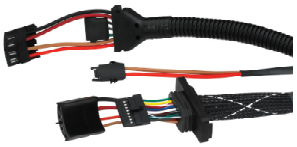
ModICE®/SHS Tooling and Mating Matrix

SHS Header	I/O	SHS Harness Connector Mate 1	SHS Harness Connector Mate 2
581 01 18 001	18	581 01 18 023	N/A
581 01 18 002	18	581 01 18 024	N/A
581 01 18 011	18	581 01 18 023	N/A
581 01 18 012	18	581 01 18 024	N/A
581 01 30 001	30	581 01 30 027	N/A
581 01 30 002	30	581 01 30 028	N/A
581 01 30 011	30	581 01 30 027	N/A
581 01 30 013	30	581 01 30 028	N/A
581 01 48 001	48	581 01 18 023	581 01 30 029
581 01 48 002	48	581 01 18 024	581 01 30 030
581 01 48 003	48	581 01 18 023	581 01 30 027
581 01 48 011	48	581 01 18 023	581 01 30 029
581 01 48 012	48	581 01 18 024	581 01 30 030
581 01 48 013	48	581 01 18 023	581 01 30 027
581 01 60 001	60	581 01 30 028	581 01 30 029
581 01 60 002	60	581 01 30 030	581 01 30 031
581 01 60 011	60	581 01 30 028	581 01 30 029
581 01 60 012	60	581 01 30 030	581 01 30 031

See pages 9-10 for SHS Harness Connectors

Connectors and Cable Assemblies

Connector Enclosure for
Engine Controller



Cable Assemblies for 4WD
Transmission Actuators

High Pin-Count Connector for
Electronic Controller

RF Enclosure
Telematics

Diesel Pressure Sensor Cap
CIN::APSE® Compression Technology

Over the years, Cinch has developed capabilities to support its customers most demanding applications. Our custom range of products include connectors and cable assemblies used in the Commercial Aircraft, Military/Aerospace, Supercomputing, On/Off Highway, Agriculture, and Industrial markets.

Please contact Cinch at **+1 507.833.8822** or **inquiry@us.cinch.com** for your special connector and connectivity requirements.