



EMM

MIL83513-G PERFORMANCES

MINIATURIZED AND RUGGED

FOR HARSH ENVIRONMENT



HARSH
ENVIRONMENT

1.27mm
pitch

OUR LEITMOTIV

MAKE
YOUR
DREAMS
A REALITY
AS AN
ENGINEER
YOU CAN
MAKE
HISTORY

TOGETHER
WE'LL FIND
THE BEST
SOLUTION

WE ARE NICOMATIC

—
Creative interconnect solutions provider

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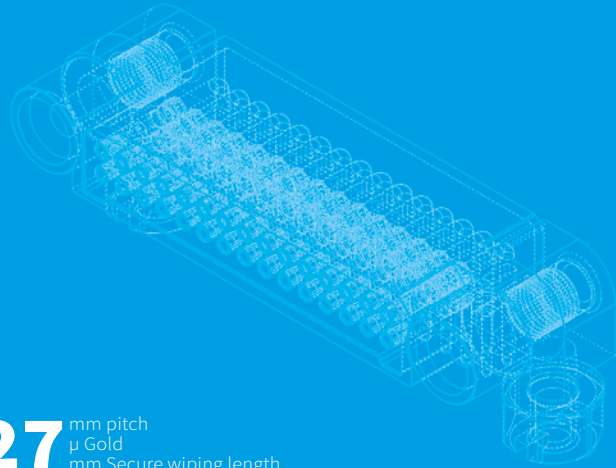
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PRODUCT CONFIGURATION

| | |
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INTRO



1.27 mm pitch
 μ Gold
mm Secure wiping length

EMM ACHIEVES
EXTRA SPACE
AND WEIGHT
REDUCTION
TO MEET YOUR
MINIATURIZATION
NEEDS IN THE
MOST EXTREME
ENVIRONMENTS

Designed to meet the performance requirements of **MIL 83513-G**, the range combines rugged design with enhanced electrical and environmental performances

FROM THE
IDEA TO THE
FINISHED
PRODUCT

SPACE SAVING

Easy installation thanks to a perfect balance between the pitch and the overall dimensions of the range.

REVERSED CONTACTS

Male contacts, thinner by essence, are protected inside the insulator.

HIGH MODULARITY

Straight male and female thru-hole
90° male and female thru-hole
Cable AWG 24-30
04 to 60 pins.

90° BACK PROTECTION

Featured exclusively on 90° connectors mount, contacts are protected at the back by an ingenious shape, also guaranteeing a perfect alignment of the contacts.

INTERCHANGEABLE HARDWARE

Locking and guiding functions available, adaptable on both male and female connectors

MATERIALS

Moulding: High performance glass fiber composite (LCP)
Male pins: Copper alloy, Au 0.75 μ
Female pins with tulip technology (clip with 4 finger spring contact)
• Outer: Copper alloy, Au 0.125 μ
• Inner: Beryllium copper, Au 1.27 μ
Fixing hardware: passivated stainless steel 300 series

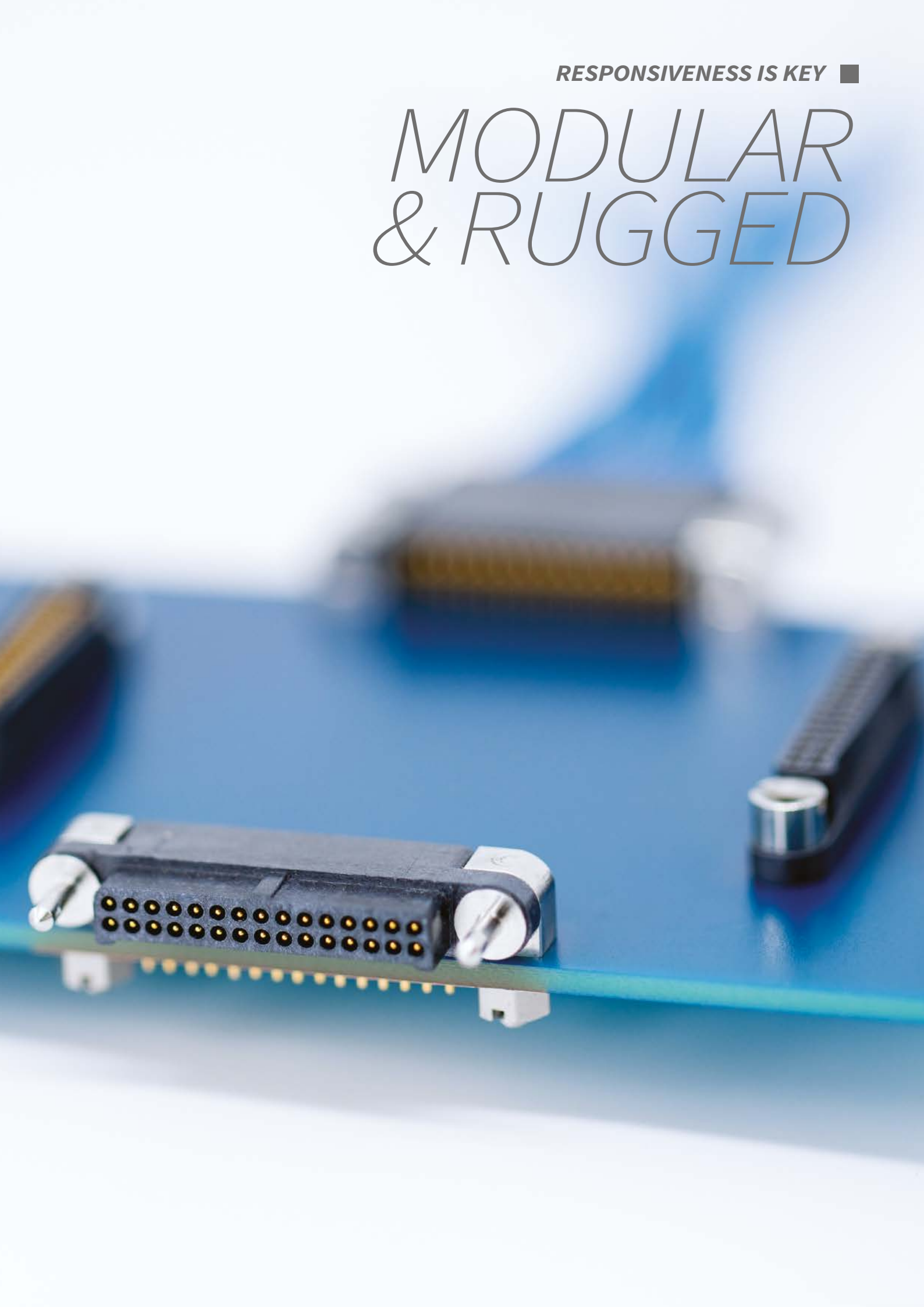
FUTURE IS SMALLER ■

SPACE & WEIGHT SAVING



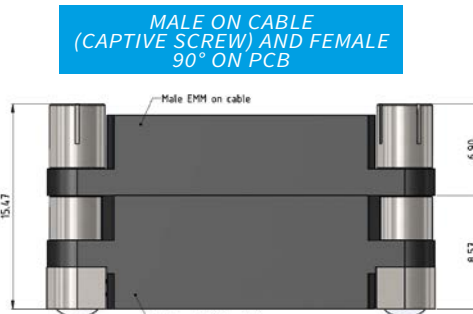
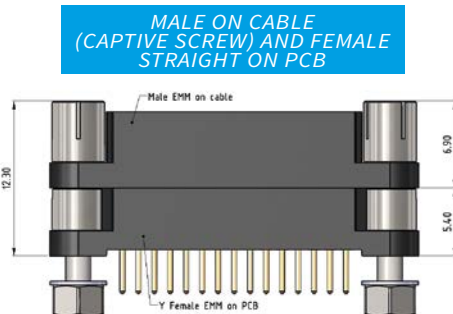
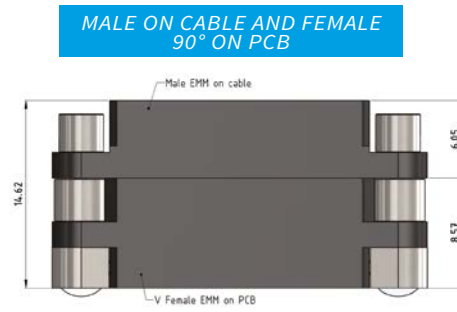
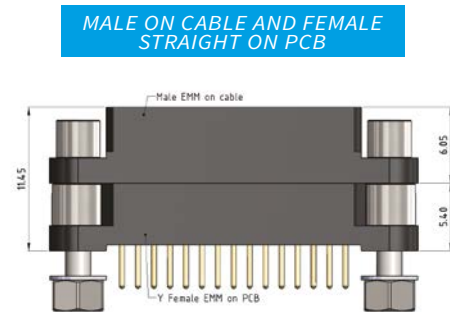
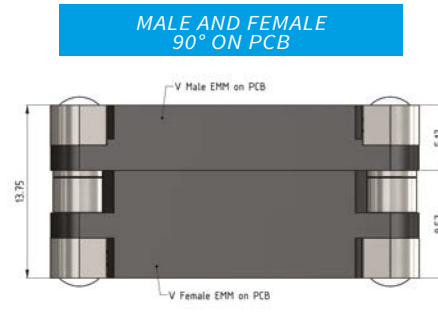
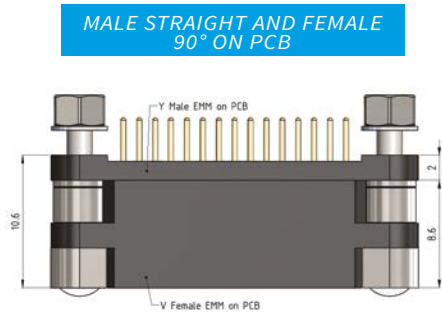
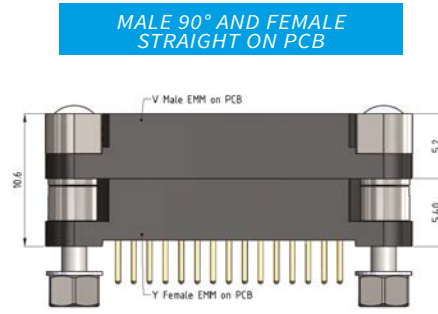
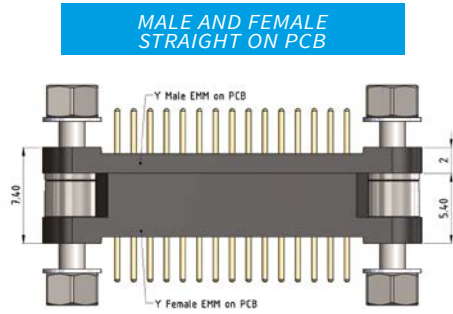
RESPONSIVENESS IS KEY ■

MODULAR & RUGGED



EMM

Overall dimensions

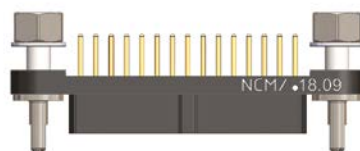


→ MARKING AND POLARIZATION

EXAMPLE
AA (Year):2018
SS (Week):09
. Pin nbr 1

MARKING

NCM = Nicomatic™ brand
AASS = year + week batch



A FEW WORDS

Jérôme

Designer

& Project manager

“This project is a model of collective success. All Nicomatic departments have been involved and brought their own touch of innovation to the global EMM product offer. Focusing on simplicity and efficiency my main objective was to limit the mechanical stress. As a result the EMM connector meets the global constraints of our customers, from both a functional and a service perspective. What we experienced and learned during the development of the EMM will benefit our other connector ranges too. EMM already offers a great modularity, and it is just the beginning !”

EMM | Main applications

Proven technology / Harsh environment requirements



→ DEFENCE

Note: Our products help to make easier maintenance



High vibration



Space saving



Modularity



→ SPACE

Note: There is no wayback for your projects



Weight saving



High altitude

TMC

Outgassing



→ MOTOR SPORT

Note: Secure your equipment



Reliability



Shock resistance



High vibration



→ CIVIL AVIATION

Note: Data reliability is a matter of life



Weight saving



Modularity



Space saving



→ UAV

Note: Saving weight and space



Weight saving



Space saving



Modularity



→ ROBOTICS

Note: High modularity



Shock resistance



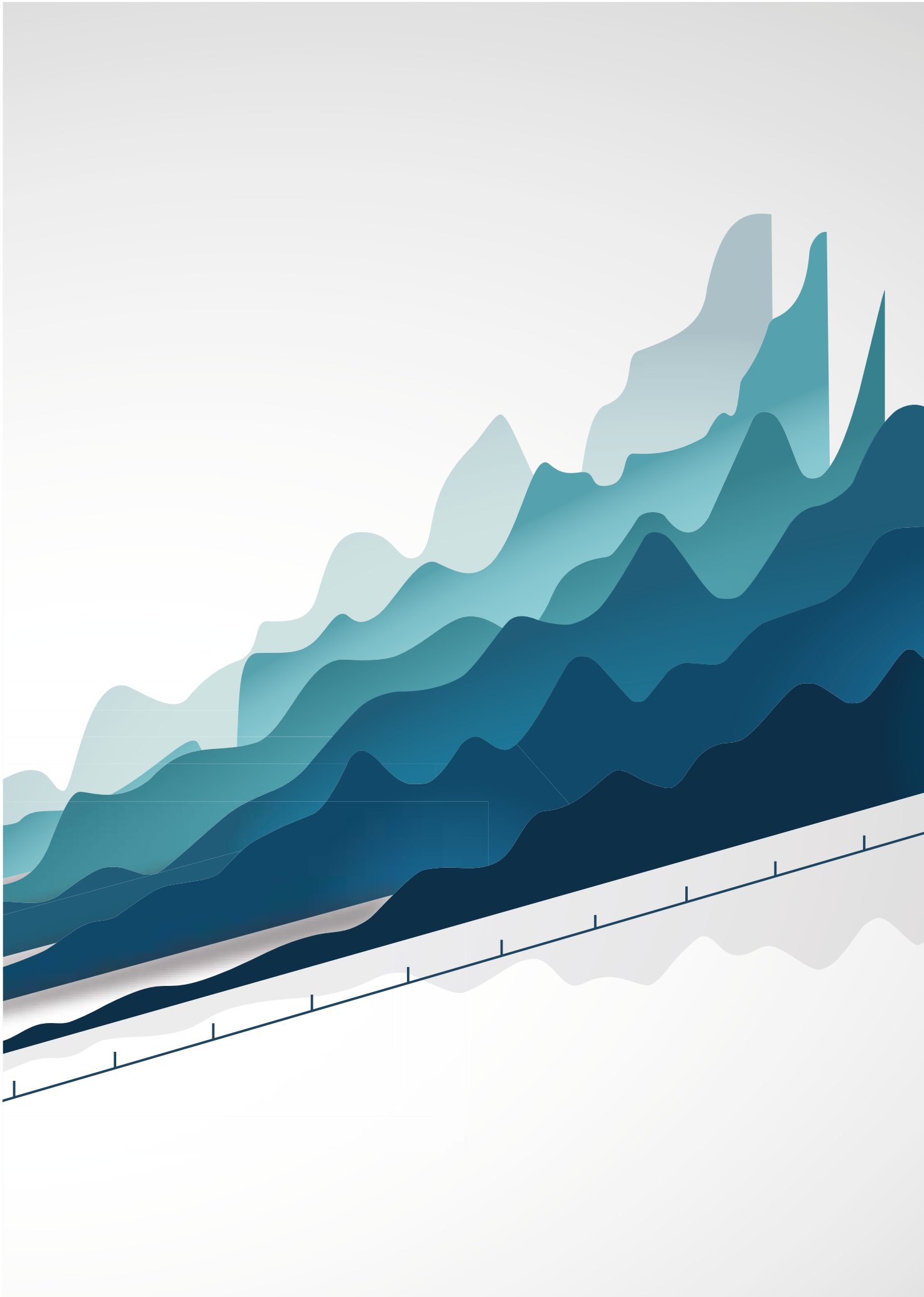
Space saving

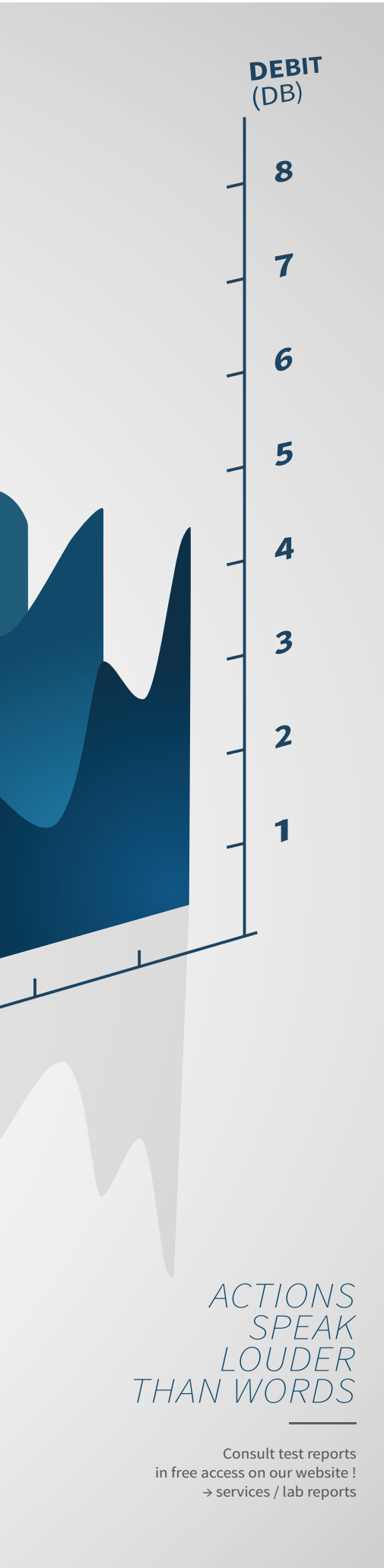


Modularity

NEED
A MINIATURIZED
& RUGGED
CONNECTOR ?

EMM
IS YOUR
SOLUTION





ACTIONS
SPEAK
LOUDER
THAN WORDS

Consult test reports
in free access on our website!
→ services / lab reports

HIGHEST
REQUIREMENTS

PRODUCT SPECS

CHALLENGE YOUR LIMITS

MEET OR EXCEED

MIL-DTL-83513G
PERFORMANCE

**ALL OUR
ENGINEERS
SUPPORT YOU**

We bring you concrete tips.



| MIL 83513-G Requirements | EMM Results |
|--|--|
| Electrical performance requirements | |
| Dielectric withstanding voltage sea level EIA-364-20C <i>(Between all adjacent contacts & fixings)</i> Dielectric withstanding voltage @sea level: 600 V RMS. Connectors shall show no evidence of breakdown or flashover | Dielectric withstanding voltage: 750 V RMS Breakdown voltage: 1000 V RMS Rated voltage: 250 V RMS |
| Dielectric withstanding voltage high altitude EIA-364-20C <i>(Between all adjacent contacts & fixings)</i> Dielectric withstanding voltage @70 000 ft: 150V RMS. Connectors shall show no evidence of breakdown or flashover | Dielectric withstanding voltage @30 000 ft: 540 V RMS Dielectric withstanding voltage @70 000 ft: 480 V RMS Dielectric withstanding voltage @100 000 ft: 465V RMS |
| Insulation resistance EIA 364-21C Shall not be less than 5 GΩ after temperature cycling and humidity | > 2000 GΩ@ 500V |
| Contact resistance EIA 364-06C For AWG 24, contact resistance shall be less than 24 mΩ | Less than 8 mΩ |
| Low level contact resistance EIA 364-06C For AWG 24, shall be less than 25 mΩ | Less than 9 mΩ |
| Magnetic permeability ASTM A342/A342M Shall not exceed 2 gamma | Less than 2 gamma |
| Contact current capability (derating) IEC 60512-5-2 Test 5b For PCB connectors, contacts shall be capable of carrying 3.0 A in continuous duty operation from -55°C to 150°C For contacts on cable, derating is depending on the cable. Refer to test results | Up to 3.9A@25°C and 2.6A @85°C for 30 pins |
| Mechanical features | |
| Contact engagement and separation forces EIA 364-37B For AWG24, contact engaging shall not exceed 1,67 N and contact separation shall be 0.14N min | Engagement force: 1N max Separation force: 0.15 N |
| Connector mating and unmating forces EIA 364-13D Shall not exceed a value equal to 2,78 N times the number of contacts | <i>Values for configurations up to 30 pins</i> Mating Force: 1.7N max Unmating Force: 0.1N min |
| Durability MIL-DTL-83513G §4,5,16 Counterpart connectors shall show no mechanical or electrical defects detrimental to the operation of the connector after 500 cycles of mating and unmating | <i>Values for configurations up to 30 pins</i> Qualified |
| Crimp tensile strength EIA 364-08B IPC-WHMA-A-620B Requested: AWG24 > 35.6 N / AWG26 > 22.3 N / AWG28 > 13.4 N AWG30 > 6.7 N NASA-STD 8739.4 Requested AWG24>22.3N / AWG 26>13.5N | AWG 24: 49.98 N min AWG 26: 36.64 N min AWG 28: 16.90 N min AWG 30: 11.30 N min |

| MIL 83513-G Requirements | EMM Results |
|--|--|
| Environmental features | |
| Vibration EIA 364-28E TEST CONDITION III&IV Shall be no interruption of electrical continuity or current flow longer than 1 microsecond MIL-DTL-83513G Test Condition IV: [196.1 m/s ² (20 gn) peak] 10 to 2000 Hz_20 min/cycle_12 cycles/axe (3 axes) | Values for configurations up to 30 pins Up to 45g |
| Shock EIA 364-27B TEST CONDITION G Shock severity: MIL-DTL-83513G Test Condition G Peak acceleration:100 g / Normal Duration: 6 ms / Waveform: Saw tooth | Values for configurations up to 30 pins Up to 160g |
| Temperature cycling EIA 364-32D Temperature cycling severity: -55°C + 125°C | Temperature cycling severity: -65°C +260°C |
| Fluid immersion MIL-DTL-83513G §4,5,18 A. Lubricating oil Aircraft turbine engines, synthetic base: 20 hours B. Coolant-dielectric fluid synthetic silicate ester base lubricant (coolanol 25): 1 hour +/- 1 minute | Qualified |
| Humidity EIA 364-31B - Method IV Ten cycles 25°-65°C, 95%RH, cycle duration: 24 hours (except steps 7a and 7b) Withstanding voltage sea level after Humidity: 360 V RMS Insulation resistance after Humidity: >1 GΩ | Qualified |
| Salt spray (corrosion) 364-26B TEST CONDITION A Duration: 96 hours @35°C / Salt solution concentration: 5% | Values for configurations up to 30 pins Qualified |
| Thermal vacuum outgassing ASTM E595 (ECSS-Q-ST-70-02C) Total mass loss: TML < 1% of the original mass Max volatile condensable material: CVCM < 0.1% of the original mass Applicable to LCP housing, ring in peek (AWG24 cabling) and backpotting Stycast 2651 MM+catalyst 9 | Qualified PEEK (TML 0.18 %, CVCM 0.01 %) / LCP (TML 0.06 %, CVCM 0.01%) / STYCAST 2651 (TML 0.43 %, CVCM 0.01%) |
| Resistance to soldering heat EIA 364-29C MIL STD 202 method 210F Bath solder T: 260°C - 10 s Iron: 350°C - 5 s | Values for configurations up to 30 pins Qualified |
| Marking MIL-STD-202, method 215 Solvent 1: Isopropyl alcohol, Kerosene (Petroleum ether), Ethylbenzene. Solvent 3: Ethanolamine, 1-methoxy-2-propanol, Water. Solvent 4: Propylene glycol, Monoethanolamine | Qualified |
| Fungus resistance 28 days/29°C/HR 90%/ TCA DO 160G | Qualified grade 0 or 1 |
| Radiation Resistance ESCC 22900 Iss.5 | Radiation severity: 10 Mrad |



EMM
RANGE

CONFIGURE YOUR SOLUTION

BUILD YOUR PART NUMBER

**ALL OUR
ENGINEERS
SUPPORT YOU**

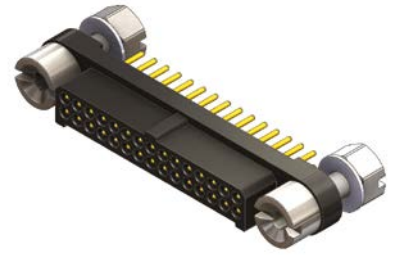
We bring you concrete tips.



EMM







Thru hole terminations
PCB from 0.8 to 3.5mm

Straight on PCB






Racking or locked fixing hardware

EMM connectors perfectly meet the needs of PCB to PCB configurations: the guiding function of their fixing hardware ease the installation process, while their great wiping length (1.27 mm min) ensures secure mating in the most severe conditions.

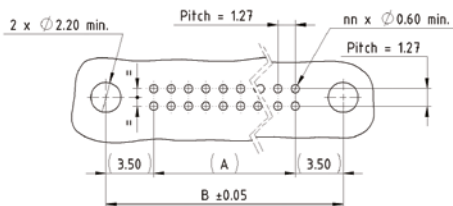
| Part numbering | | | | | | | |
|-----------------|----------|--|----------------|--|--|---------|--|
| E Series 2 rows | Gender | LF contact type | LF contact nbr | Fixing | Visual | Mating | Visual |
| E22 | 1 Male | Y/YL Straight Thru hole 3mm/4.5mm | 04 to 60 | E10/E10L Male Straight Guiding |  | E60/E61 |  |
| | 2 Female | | | E50/E50L Female Straight Jackscrew |  | E01/E02 |  |
| | | | | E60/E60L Female Straight Guiding |  | E10/E11 |  |

→ FIXING HARDWARE

All the fixing hardware is compatible with male and female connectors

| Code | Description | PCB thickness (mm) | Torque (Nm) | Overview |
|----------|---------------------------|--------------------------|-------------|---|
| E10/E10L | Male Straight Guiding | 0.8 to 2 max/ 3.5 max | 0.3 |  |
| E50/E50L | Female Straight Jackscrew | 0.8 to 2 max/ 3.5 max | 0.3 |  |
| E60/E60L | Female Straight Guiding | 0.8 to 2 max/ 3.5 max | 0.3 |  |

→ THRU HOLE TYPE PCB LAYOUT



| Dimension table | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| LF contact number | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 | 42 | 44 | 46 | 48 | 50 | 52 | 54 | 56 | 58 | 60 |
| A=Distance between pins (mm) | 1.27 | 2.54 | 3.81 | 5.08 | 6.35 | 7.62 | 8.89 | 10.16 | 11.43 | 12.70 | 13.97 | 15.24 | 16.51 | 17.78 | 19.05 | 20.32 | 21.59 | 22.86 | 24.13 | 25.40 | 26.67 | 27.94 | 29.21 | 30.48 | 31.75 | 33.02 | 34.29 | 35.56 | 36.83 |
| B=Distance between fixings (mm) | 8.27 | 9.54 | 10.81 | 12.08 | 13.35 | 14.62 | 15.89 | 17.16 | 18.43 | 19.7 | 20.97 | 22.24 | 23.51 | 24.78 | 26.05 | 27.32 | 28.59 | 29.86 | 31.13 | 32.4 | 33.67 | 34.94 | 36.21 | 37.48 | 38.75 | 40.02 | 41.29 | 42.56 | 43.83 |

EMM

Thru hole terminations
PCB from 0.8 to 3.5mm

90° on PCB



Racking or locked fixing hardware

EMM 90° on PCB connectors present an exclusive feature to reinforce robustness. The back shape of the connector brings additional protection and ensures a perfect alignment of the contacts.

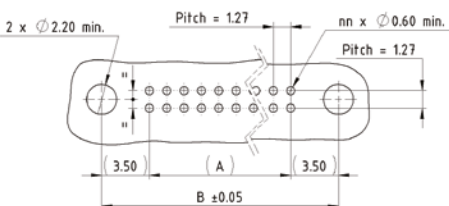
| Part numbering | | | | | | | |
|-----------------|----------|------------------------------|----------------|-------------------------------|--------|---------|--------|
| E Series 2 rows | Gender | LF contact type | LF contact nbr | Fixing | Visual | Mating | Visual |
| E22 | 1 Male | V/VL 90° Thru hole 3mm/4.5mm | 04 to 60 | E11/E11L Male 90° Guiding | | E60/E61 | |
| | 2 Female | | | E51/E51L Female 90° Jackscrew | | E01/E02 | |
| | | | | E61/E61L Female 90° Guiding | | E10/E11 | |

→ FIXING HARDWARE

All the fixing hardware is compatible with male and female connectors

| Code | Description | PCB thickness (mm) | Torque (Nm) | Overview |
|----------|----------------------|--------------------------|-------------|----------|
| E11/E11L | Male 90° Guiding | 0.8 to 2 max/ 3.5 max | 0.3 | |
| E51/E51L | Female 90° Jackscrew | 0.8 to 2 max/ 3.5 max | 0.3 | |
| E61/E61L | Female 90° Guiding | 0.8 to 2 max/ 3.5 max | 0.3 | |

→ THRU HOLE TYPE PCB LAYOUT



| Dimension table | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| LF contact number | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 | 42 | 44 | 46 | 48 | 50 | 52 | 54 | 56 | 58 | 60 |
| A=Distance between pins (mm) | 1.27 | 2.54 | 3.81 | 5.08 | 6.35 | 7.62 | 8.89 | 10.16 | 11.43 | 12.70 | 13.97 | 15.24 | 16.51 | 17.78 | 19.05 | 20.32 | 21.59 | 22.86 | 24.13 | 25.40 | 26.67 | 27.94 | 29.21 | 30.48 | 31.75 | 33.02 | 34.29 | 35.56 | 36.83 |
| B=Distance between fixings (mm) | 8.27 | 9.54 | 10.81 | 12.08 | 13.35 | 14.62 | 15.89 | 17.16 | 18.43 | 19.70 | 20.97 | 22.24 | 23.51 | 24.78 | 26.05 | 27.32 | 28.59 | 29.86 | 31.13 | 32.40 | 33.67 | 34.94 | 36.21 | 37.48 | 38.75 | 40.02 | 41.29 | 42.56 | 43.83 |

EMM

Pre wired or to crimp contacts
With or without backpotting





For cabling



Racking or locked fixing hardware

To crimp or pre cabled, from AWG24 to AWG30 :
whatever your expectation, EMM connectors
will meet your need. Backpotting is recommended
for enhanced protection.


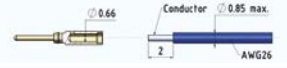


→ TO CRIMP

| Part numbering | | | | | | | |
|-----------------|--------|---|----------------|--|--|---------|--|
| E Series 2 rows | Gender | LF contact type | LF contact nbr | Fixing | Visual | Mating | Visual |
| E22 | 1 Male | A AWG 24 Contact Ø0.66 mm with ring in Peek | 04 to 60 | E01 Jackscrew for Harness |  | E50/E51 | E50  |
| | | B AWG 26 Contact Ø0.66 mm | | E02 Captive Screw for Harness |  | | E51  |
| | | G AWG 28-30 Contact Ø0.46 mm | | | | | |

Contacts A and B are the same ones. The differentiation in the codification comes from the addition of a ring in peek to crimp the AWG 24.

| Code | Description | Torque (Nm) | Overview |
|------|---------------------------|-------------|---|
| E01 | Jackscrew for harness | 0.2 |  |
| E02 | Captive Screw for harness | 0.2 |  |

→ SIGNAL CONTACT

| Code | Reference | Type | Cable gauge | Current carrying capacity @25°C | Derating @25°C | Recommended wire | View |
|------|---------------|---------------|-------------|---------------------------------|----------------|------------------|---|
| A | 18224 + 18281 | To be crimped | AWG 24 | Up to 5A | Up to 4A | M16878/6-BEE |  |
| B | 18224 | | AWG 26 | Up to 4.5A | Up to 3.5A | M16878/6-BDE |  |
| G | 18240 | | AWG 28 | Up to 4A | Up to 3.2A | M16878/6-BCE |  |
| | 18240 | | AWG 30 | Up to 3.2A | Up to 2.6A | M16878/6-BBE |  |



Values for configurations up to 30 pins

→ PRE CABLED

| Part numbering | | | | | | | | | |
|--------------------|-----------|--------------------------|---|-------------------|---------------------------------|--------------------------------------|-----------|-------------------------------|--------|
| E Series 2 rows | Gender | Signal wire + color # | Shape & potting | LF contact nbr | Fixing | Serie HP / HF Contact | Shielding | Config. | Length |
| HE22 | 1 Male | D# AWG 30 | P 2mm potting shape | 04 to 60 | E00 no fixing | ∅ If signal (LF) contacts only | Z no | F Fly lead | XXXX |
| | | H# AWG 28 | | | | | | B Back to back | |
| | | I# AWG 26 | Q 2mm potting shape + potting | | E01 Jackscrew for Harness | | | N Back to back reversed | |
| | | J# AWG 24 | | | | | | | |

TOOLING

→ SIGNAL(LF) CONTACT
CRIMPING TOOL

| Reference | Description | View |
|-----------|----------------------------------|---|
| MH800 | Crimping Hand tool DANIELS MH800 |  |
| C19040 | Positioner for signal contacts |  |

| # WIRE COLOR | |
|--------------|------------------|
| 0 | Black |
| 1 | Brown |
| 2 | Red |
| 3 | Orange |
| 4 | Yellow |
| 5 | Green |
| 6 | Blue |
| 7 | Violet |
| 8 | Grey |
| 9 | White |
| R | Rainbow repeated |



Crimping instruction available on the website ICLF02

→ SIGNAL(LF) CONTACT
INSERTION/EXTRACTION TOOL

| Reference | Description | View |
|-----------|-----------------------------|---|
| C19039 | Insertion & Extraction tool |  |



Instruction available on the website IILF02

→ TORQUE CONTROL SCREW DRIVER
PRE SET TORQUE CONTROL

| Reference | Description | View |
|-----------|--|---|
| C19494 | Two screwdrivers and 4 bolt tips packaged in box |  |
| 18034 | Preset Screwdriver 0.2 Nm (Yellow) |  |
| 18035 | Preset Screwdriver 0.3 Nm (Blue) |  |
| 18040 | Internal hex 2 tip |  |
| 18043 | Specific socket tip |  |
| 18665 | Slot head tip with clearance |  |
| C19495 | Screw-fastening aid |  |

CREATIVE INTERCONNECT SOLUTIONS

With over 40 years of experience, Nicomatic combines a proven track record and continuous innovation.

We provide solutions for defense, security, energy, space, civil avionics, and many other applications, respecting our core values based on service, quality and close relationship with our customers.

HUMAN FACTOR

is the key to success.

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