NICOMATIC

CREATIVE
INTERCONNECT
SOLUTIONS

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

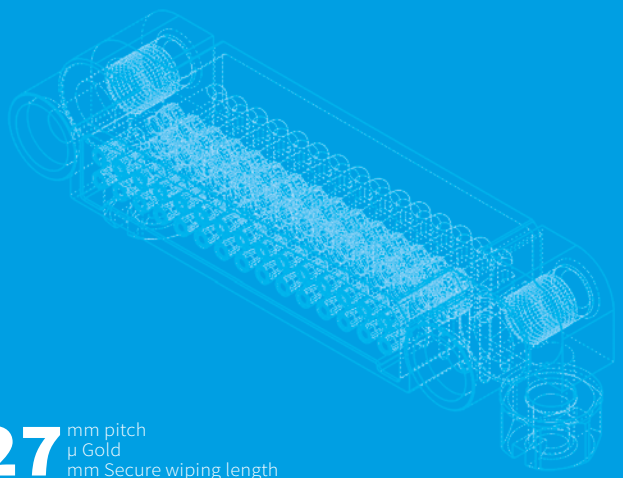
SUMMARY

INTRO

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

→ **DESIGNED IN 2018**



1.27 mm pitch
µ Gold
mm Secure wiping length

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

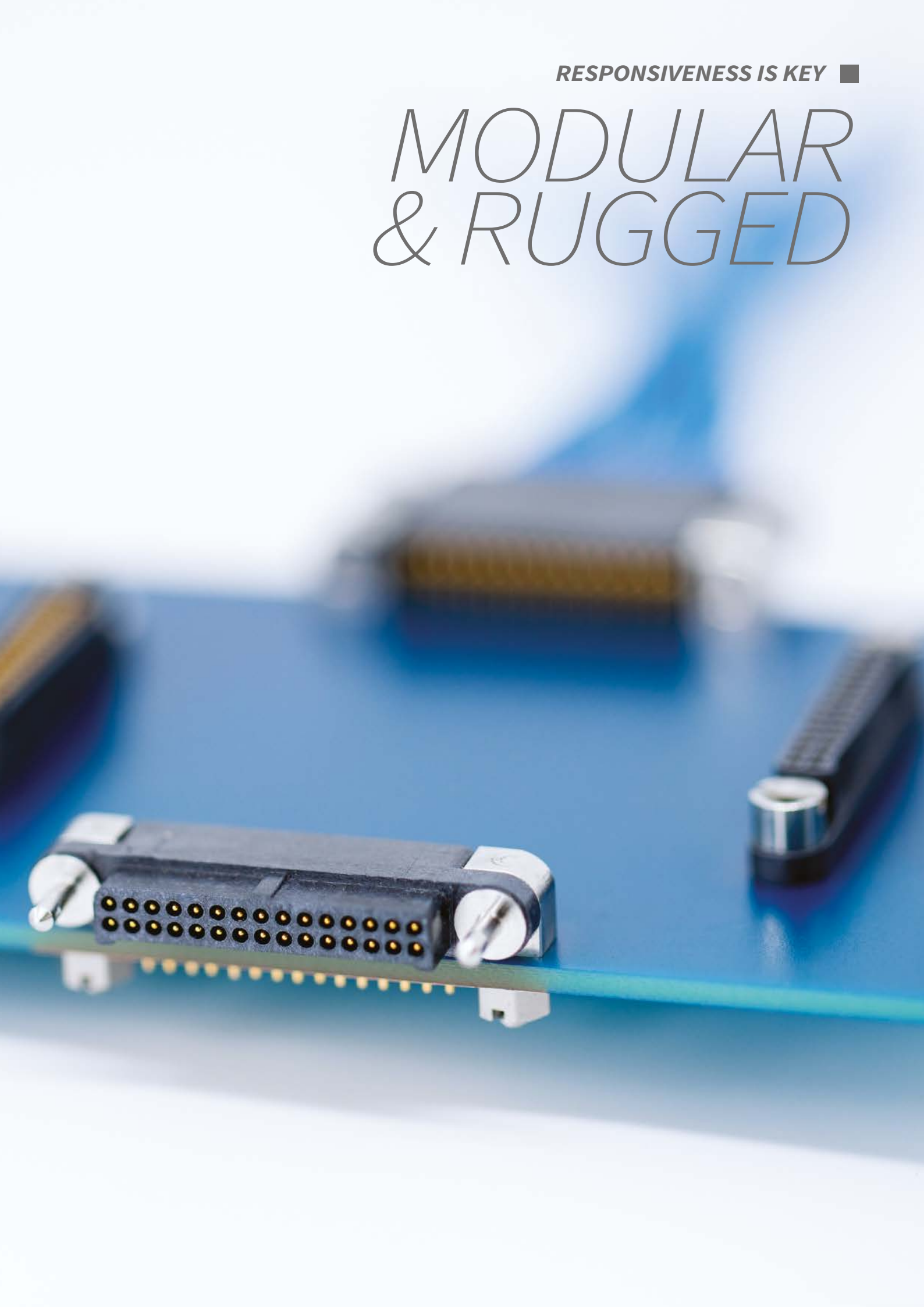
Moulding: High performance glass fiber composite (LCP)
Male pins: Copper alloy, Au 0.75µ
Female pins with tulip technology (clip with 4 finger spring contact)
- Outer: Copper alloy, Au 0.125µ
- Inner: Berrylium copper, Au 1.27µ

Fixing hardware: passivated stainless steel 300 series

SPACE & WEIGHT SAVING

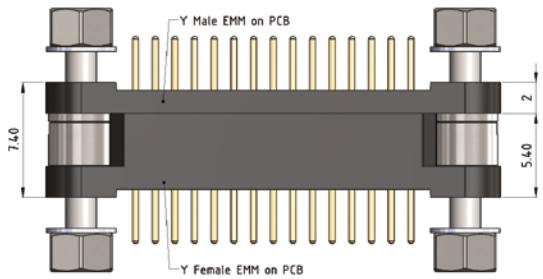
RESPONSIVENESS IS KEY

MODULAR & RUGGED

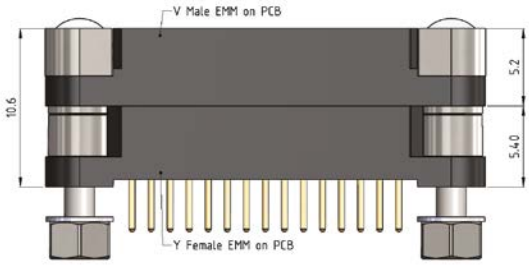


EMM | Overall dimensions

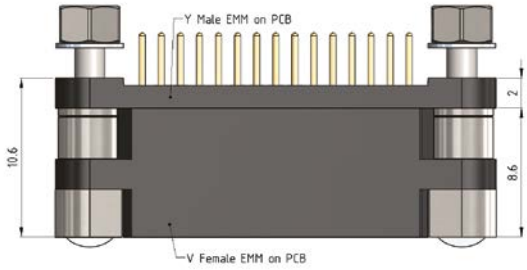
MALE AND FEMALE STRAIGHT ON PCB



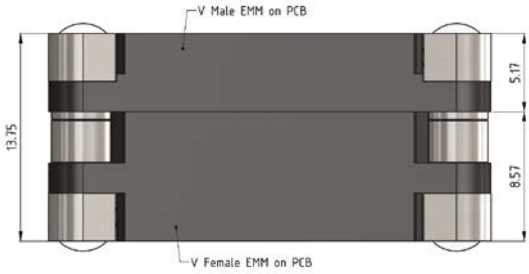
MALE 90° AND FEMALE STRAIGHT ON PCB



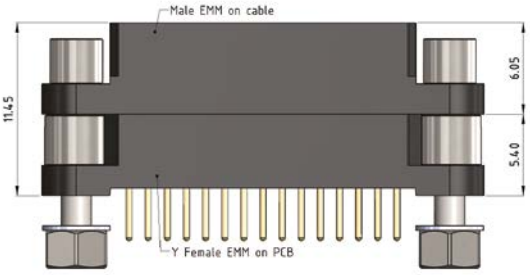
MALE STRAIGHT AND FEMALE 90° ON PCB



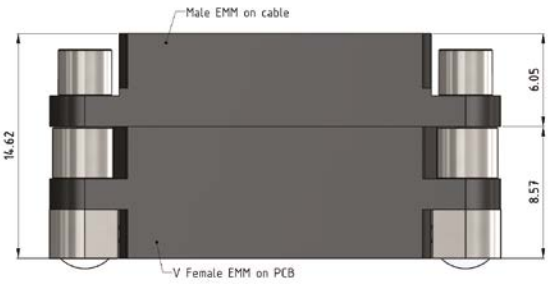
MALE AND FEMALE 90° ON PCB



MALE ON CABLE AND FEMALE STRAIGHT ON PCB



MALE ON CABLE AND FEMALE 90° ON PCB

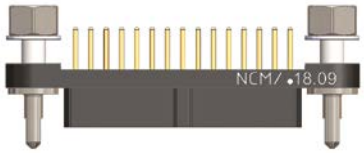


→ MARKING AND POLARIZATION

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

MARKING

NCM = Nicomatic[TH] 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 !"

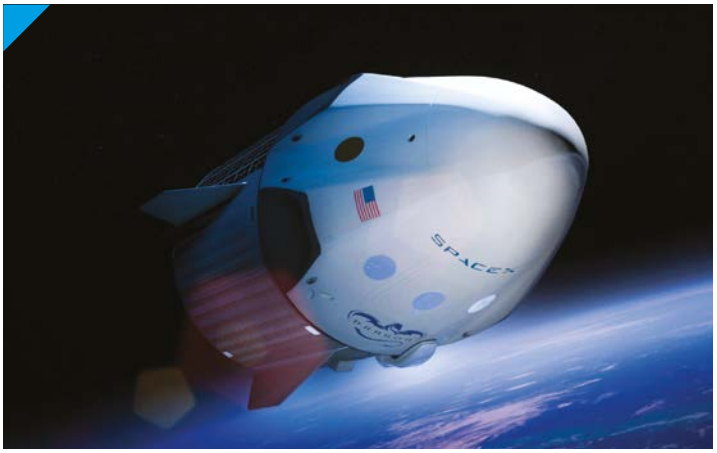
EMM | Main applications

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*
- *Outgassing*

→ MOTOR SPORT

Note: *Secure your equipment*

- *Reliability*
- *Shock resistance*
- *High vibration*

→ CIVIL AVIATION

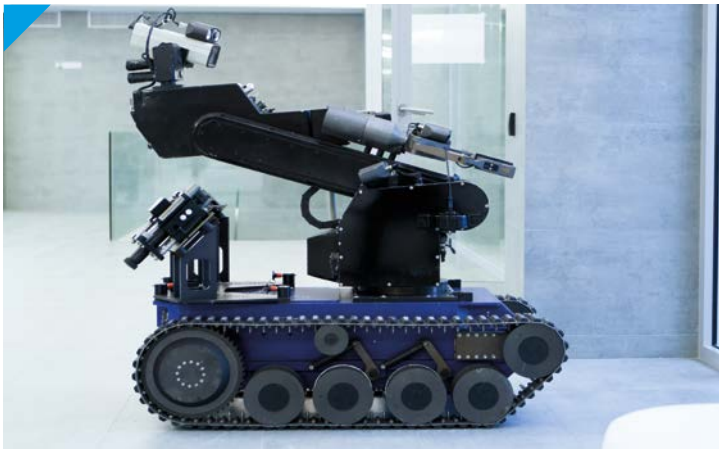
Note: *Data reliability is a matter of life*

Weight saving *Modularity* *Space saving*

→ UAV

Note: *Saving weight and space*

Weight saving *Space saving* *Modularity*



→ ROBOTICS

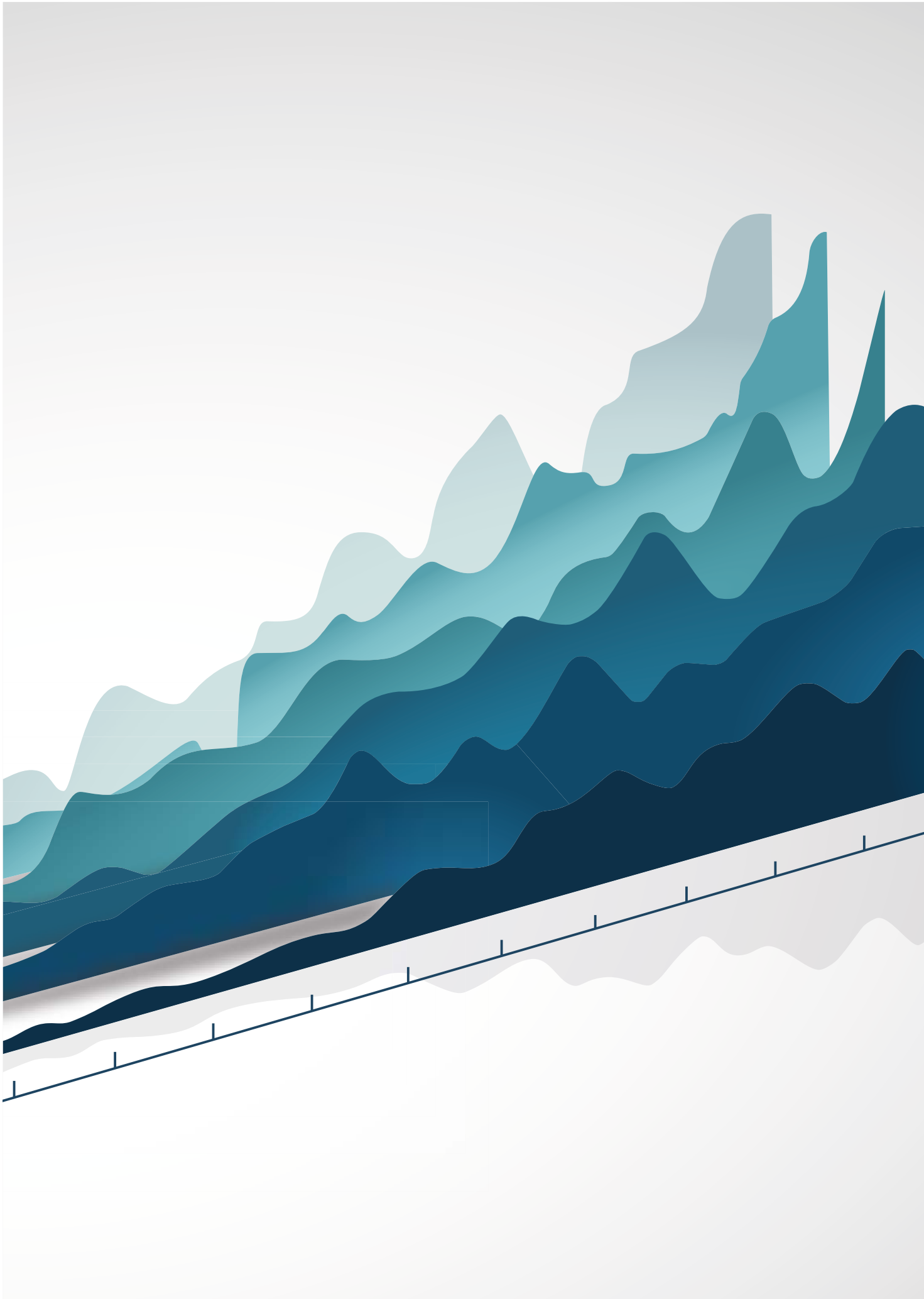
Note: *High modularity*

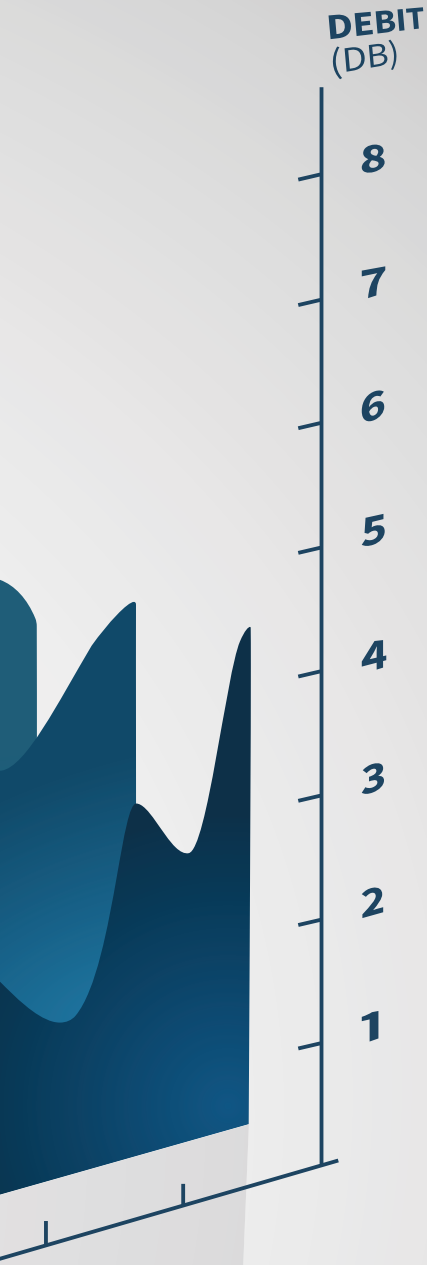
Shock resistance *Space saving* *Modularity*

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.

TIPS

MIL 83513-G Requirements	EMM Results
Electrical performance requirements	
Dielectric withstanding voltage sea level *EIA-364-20C* *(Between all adjacent contacts & fixings)* *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* *(Between all adjacent contacts & fixings)* *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**
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*	**3A@25°C and 1.6A@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*	*Values for configurations up to 30 pins* 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*	*Values for configurations up to 30 pins* **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**

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/s2 (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**

EMM
RANGE

CONFIGURE YOUR SOLUTION

BUILD YOUR PART NUMBER

ALL OUR ENGINEERS SUPPORT YOU

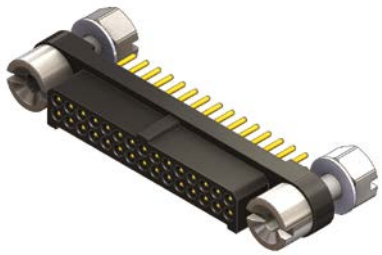
We bring you concrete tips.

TIPS

EMM

Thru hole terminations
PCB from 0.8 to 2mm

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.

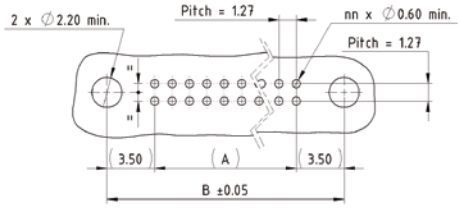
Part numbering							
E Series 2 rows	*Gender*	*LF contact type*	*LF contact nbr*	*Fixing*	*Visual*	*Mating*	*Visual*
E22	1 Male	Y Straight Thru hole 3mm	04 to 60	E10 Male Straight Guiding		E60/E61	
				E50 Female Straight Jackscrew		E01	
	2 Female			E60 Female Straight Guiding		E10/E11	

→ *FIXING HARDWARE*

All the fixing hardware is compatible with male and female connectors

Code	*Description*	*PCB thickness (mm)*	*Torque (Nm)*	*Overview*
E10	Male Straight Guiding	0.8 to 2 max	0.3	
E50	Female Straight Jackscrew	0.8 to 2 max	0.3	
E60	Female Straight Guiding	0.8 to 2 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

90° on PCB

Thru hole terminations
PCB from 0.8 to 2mm

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.

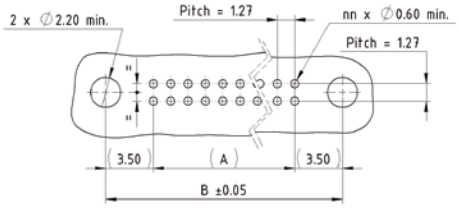
Part numbering							
E Series 2 rows	*Gender*	*LF contact type*	*LF contact nbr*	*Fixing*	*Visual*	*Mating*	*Visual*
E22	1 Male	V 90° Thru hole 3mm	04 to 60	E11 Male 90° Guiding		E60/E61	
				E51 Female 90° Jackscrew		E01	
	2 Female			E61 Female 90° Guiding		E10/E11	

→ FIXING HARDWARE

All the fixing hardware is compatible with male and female connectors

Code	*Description*	*PCB thickness (mm)*	*Torque (Nm)*	*Overview*
E11	Male 90° Guiding	0.8 to 2 max	0.3	
E51	Female 90° Jackscrew	0.8 to 2 max	0.3	
E61	Female 90° Guiding	0.8 to 2 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 backpotting

For cabling

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.

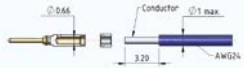
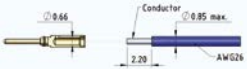
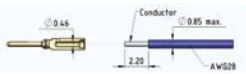
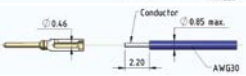
→ TO CRIMP

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					**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	

→ 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	Ø 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							

#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

TOOLING

→ SIGNAL(LF) CONTACT CRIMPING TOOL

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

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

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.

We promote initiative and responsibility,
We encourage creativity & reactivity,
To better meet your needs and anticipate your requirements.

Ready to join our team ?

recruitment@nicomatic.com

HEADQUARTER

FRANCE
T:+33 (0)4 50 36 13 85
france@nicomatic.com

MEMBER OF
Gifas - Eden
Aerospace cluster

SUBSIDIARIES

UNITED STATES
T:+1 215 444 9580
usa@nicomatic.com

CHINA
T:+86 (0)22-23858836
china@nicomatic.com

INDIA
T: +91 80 4213 1574
india@nicomatic.com

UNITED KINGDOM
T: + 44 (0)11 83 801033
uk@nicomatic.com

GERMANY
T: +49 (0)33203 878800
germany@nicomatic.com

TURKEY
T: +90 (0)312 504 37 29
turkey@nicomatic.com

SOUTH KOREA
T: +82 (0)2 553 6822
korea@nicomatic.com

JAPAN
T: +81 (0)80 2138 0909
japan@nicomatic.com

SINGAPORE
T: +65 6262 1280
singapore@nicomatic.com

TAIWAN
T: +886 (0)2 2311 2667
mailto:taiwan@nicomatic.com

CANADA
T: +41 (0)438 885 3395
canada@nicomatic.com

NICOMATIC

WEBSITE
nicomatic.com

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