



DEUTSCH

INDUSTRIAL



## Controller Area Network Series Technical Manual

A STEP AHEAD



## Connecting to Technology

OEM's future electrical demands for off-highway equipment driven today by highway systems.

Today's over-the-road electrical systems are driving the demand for improved electrical communication systems. Trucks go down the road today monitoring everything from brake and transmission temperature, fuel usage to light bulb life and this may only be the beginning. Some predictions are that in the future, trucks and buses may have as many as forty functions controlled by computer. Thus, the demand for standardized electrical interfaces is expected to increase. Applications will also expand in the off-highway markets to excavators, implements and trenchers.

The common thread is SAE J1939. Improved electrical systems as defined under SAE J1939 allow electrical devices to communicate with each other. Communication occurs using a Controller Area Network (CAN) between intelligent sensors over a serial network. Through a series of microprocessors a CAN interconnects every device establishing a common link between each. The host CAN protocol has been around about ten years. The heart of these systems is microchip based. These chips are now widely available and able to function in harsh environments making them suitable for off-highway use. Their application began on production factory floors in motion and process controllers, moved into cars and trucks and are now migrating to the off-highway markets.

In a marketplace fueled by demands to do more, better and faster there is more good news for off-highway OEM's. CAN chips are now evolving into second and third generations. Many of these chips are specialized to perform specific tasks and are now readily available.

Defined in SAE J1939 under slash sheets /11, /12 and /15 are electrical interconnects. Under /11 is a description of the truck and bus physical layer and four connectors. The Deutsch standard "DT" series represents the connector of choice for these general purpose applications. An inline, bulkhead, "T" splitter and terminating connector make up this hardware set. The /12 is actually released internationally as specification ISO/CD 11783-2 and defines and ISO Box an three connector pairs. This group of electrical interfaces terminates a CAN between the Tractor and its implement. Its main feature is a "breakaway" function that prevents damage to the tractor or implement in case of an accidental drive-away disconnect. The /13 portion of the document describes the nine pin diagnostic connector set. This includes a standard Deutsch "HD10" mated pair and a plug tool for testing. Like other components in this system these interconnects are rugged off-the-shelf items that have proven themselves over time.



# Controller Area Network Series Technical Manual



Whether you're building a Controller Area Network for on or off-highway, machine manufacture, construction, material handling, forestry machines, aerial work platforms, road building, or your OEM fleet of fire engines, your local Deutschman can supply your needs. We offer several configurations: 2-wire, 3-wire, and 4-wire, in-line and flange mount, along with splitters, heavy-duty breakaway connectors, and off-board 9-pin diagnostic connector.



Without Deutsch's J1939-approved interconnecting devices and ISO/CD 11783-2 approved ISO Box Interface, today's farm implements and construction machinery wouldn't be nearly as smart. This little black box accommodates ISO 11783-2's 4-wire technology with a circuit board inside transmitting signals between farm implements and tractors.



The continued sophistication in design of construction equipment is demanding the same systems responsiveness as the heavy trucking and agricultural industries. The application of J-1939 has allowed designers to improve both the quantity and quality of the options offered along with increased electrical system reliability.



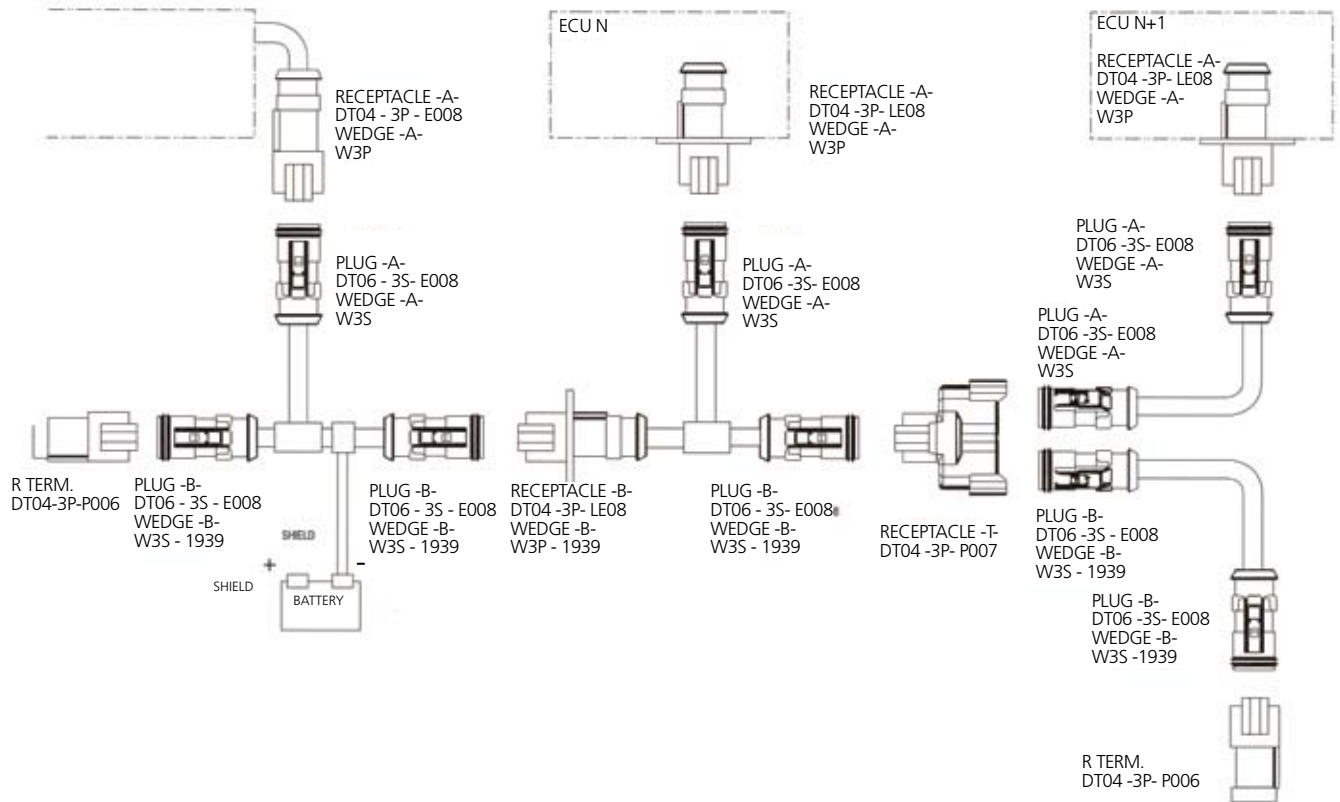
Mounted in the truck cab, bus passenger door, or by the operator's seat or under the dash of construction and agricultural equipment, the 9-pin On-Board Diagnostic Connector accommodates CAN-H and CAN-L (for /12) plus CAN\_SHLD (for /11). Cavity identification is designated in accordance with J1939/13.



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## SAE J1939 Connector Usage



## Applicable Part Numbers

### ISO/CD 11783-2 & J-1939/12 ISO BOX AND ASSOCIATED CONNECTORS

HDBOX-24-91PN	ISO Box Assembly
HDBOX-24-91PE	ISO Box Assembly, w/Reduced Wire Seal
HD36-24-91SN-059	Plug, w/Cable Clamp Assembly
HD36-24-91SE-059	Plug, w/Cable Clamp Assembly & Reduced Wire Seal
HDB36-24-91SN-059	Plug, w/Break-Away Coupling, Ring & Cable Clamp Assembly
HDB36-24-91SE-059	Plug, w/Break-Away Coupling Ring, Cable Clamp Assembly & Reduced Wire Seal
DT06-4S-EP06	Plug, Black, w/End Cap
DT06-2S-EP06	Plug, Black, w/End Cap
W4S-P012	Wedge Lock
W2S-P012	Wedge Lock
0460-204-08141	Pin, Size 8
0460-204-12141	Pin, Size 12
0460-202-1631	Pin, Size 16, Gold
0462-203-08141	Socket, Size 8
0462-203-12141	Socket, Size 12
0462-201-1631	Socket, Size 16, Gold





## UNIVERSAL 9-PIN DIAGNOSTIC

HD10-9-1939P	Receptacle
HD10-9-1939PE	Receptacle, w/Reduced Wire Seal
HD16-9-1939S	Plug, w/Coupling Ring
HD16-9-1939SE	Plug, w/Coupling Ring & Reduced Wire Seal
HD17-9-1939S	Plug, No Coupling Ring (Slip-on)
HD17-9-1939SE	Plug, No Coupling Ring (Slip-on), Reduced Wire Seal
0460-202-1631	Pin, Size 16, Gold
0460-247-1631	Pin, Size 16, Extended, Gold
0462-201-1631	Socket, Size 16, Gold
0462-221-1631	Socket, Size 16, Extended, Gold

## J-1939/15 2-WIRE SYSTEM

DTM04-2P-P007	Receptacle, "Y" Connector
DTM04-2P-E007	Receptacle, Grey, w/Shrink Boot Adapter
DTM04-2P-P006	Receptacle, Grey, w/120 Ohm Resistor
DTM04-2P-EE03	Receptacle, Black, w/Shrink Boot Adapter
DTM06-2S-P007	Plug, Grey, w/Shrink Boot Adapter
DTM06-2S-P006	Plug, Grey, w/120 Ohm Resistor
DTM06-2S-EE03	Plug, Black, w/Shrink Boot Adapter
DTM06-2S-EP10	Plug, Black, w/120 Ohm Resistor
WM-2P	Wedge Lock, Orange
WM-2PA	Wedge Lock, Grey
WM-2PB	Wedge Lock, Black
WM-2S	Wedge Lock, Orange
WM-2SA	Wedge Lock, Grey
Wm-2SB	Wedge Lock, Black
0460-202-2031	Pin, Size 20, Gold
1060-20-0144	Pin, Size 20, Gold, Stamped & Formed
0462-201-2031	Socket, Size 20, Gold
1062-20-0144	Socket, Size 20, Gold, Stamped & Formed

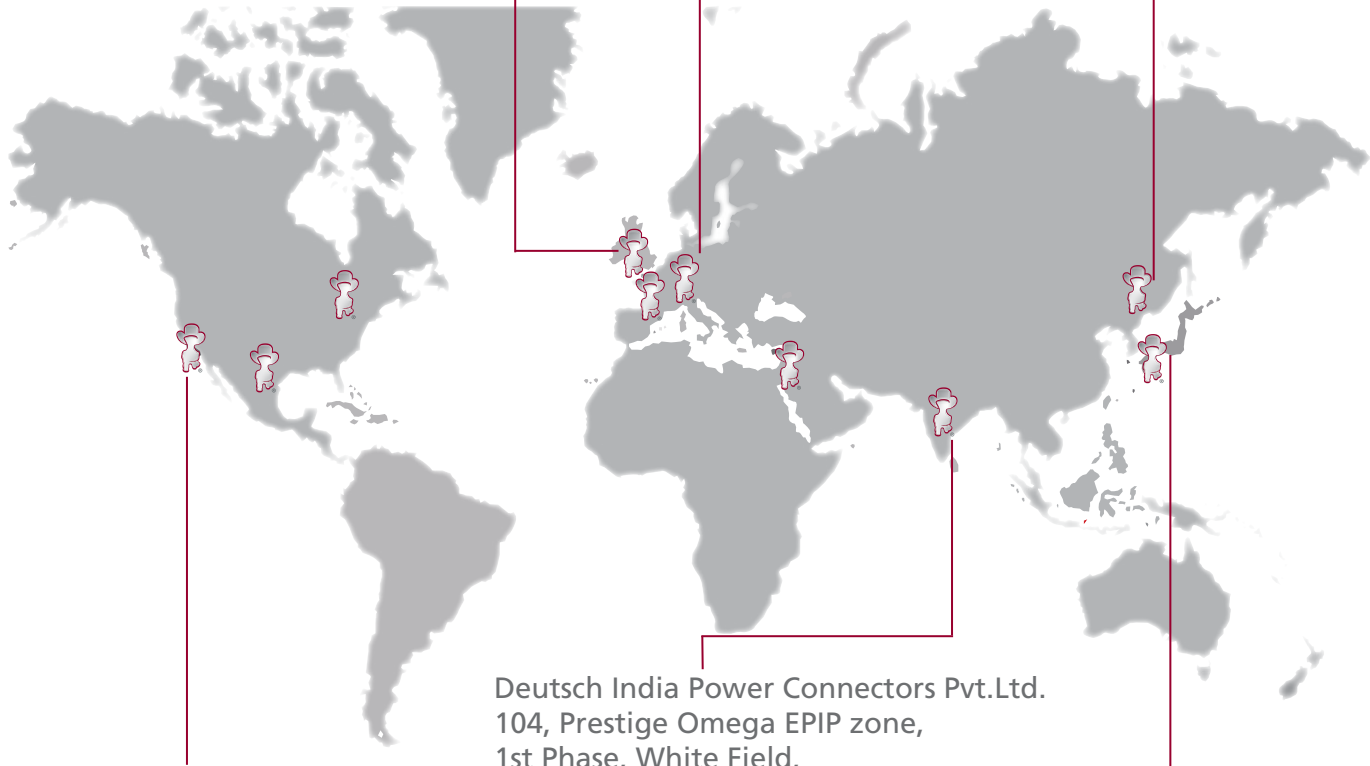
## J-1939/11 3-WIRE SYSTEM

DT04-3P-P007	Receptacle, "Y" Connector
DT04-3P-E008	Receptacle, Grey, w/Shrink Boot Adapter
DT04-3P-P006	Receptacle, Grey, w/120 Ohm Resistor
DT04-3P-EE01	Receptacle, Black, w/Shrink boot Adapter
DT04-3P-EP10	Receptacle, Black, w/120 Ohm Resistor
DT06-3S-E008	Plug, Grey, w/Shrink Boot Adapter
DT06-3S-P006	Plug, Grey, w/120 Ohm Resistor
DT06-3S-EP11	Plug, Black, w/Shrink Boot Adapter
DT06-3S-PP01	Plug, Black, w/120 Ohm Resistor
DT06-3S-PE01	Plug, Black, w/120 Ohm Resistor & Latch Guard
DT06-3S-EP10	Plug, Black, w/120 Ohm Resistor
DT06-3S-P032	Plug, Black, w/Shrink Tubing Adapter, Single Piece
W3P-1939	Wedge Lock, Blue
W3S	Wedge Lock, Orange
W3S-P012	Wedge Lock, Green
W3S-1939	Wedge Lock, Blue
W3S-1939-P012	Wedge Lock, Blue
0460-202-1631	Pin, Size 16, Gold
1060-16-0144	Pin Size 16, Gold Stamped & Formed
0460-247-1631	Pin, Size 16, Extended, Gold
0462-201-1631	Socket, Size 16, Gold
1062-16-0144	Socket, Size 16, Gold, Stamped & Formed
0462-221-1631	Socket, Size 16, Extended, Gold

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