

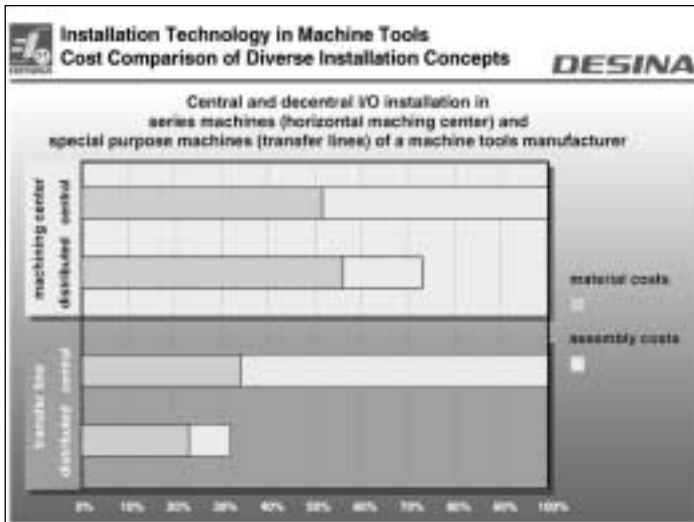
DEcentralized Sandardized INstallation technology

DESINA® describes an extensive concept for the standardization and decentralization of the fluid power and electrical installation of machines and applications.

Based on the results of intensive examinations from the Institute of Machine Tools and Business Managements (iwb) in cooperation with the University of Munich, the German machine tool association (VDW) started the DESINA® project.

In close cooperation with the VDW machine tool manufacturers, end users in the automobile industry and the supply industry also helped to develop the specifications.

The goal of this concept is to reduce total cost. The total cost includes the installation cost (material and assembly cost) as well as operating and maintenance cost.



Cost saving with DESINA®

Important saving aspects with DESINA® components from Murrelektronik :

- Less expenditure of project and documentation due to decentralization and modularity concept
- Reduction of product variety due to standardization of interface and connection elements – therefore cost reduction of purchasing and inventory levels
- Pre-wired plug-in connection technology prevents installation mistakes
- More efficient set-up due to clear and modular machine design
- Increased availability and reduced downtime due to diagnostic capabilities and consequent plug-in connections
- Service and maintenance is easier due to clear and distinct color coded cable based on functionality

Murrelektronik as a component vendor aided with the DESINA® specifications and is available for you as a competent partner.

In addition Murrelektronik underlines the position as a system supplier in the DESINA® installation technology with numerous products for sensor/actuator technology, hybrid-field-bus couplers with connection cables as well as field-bus components.

Connection systems for sensors and actuators

The M12 round plug connectors for sensors can now also be used for valves. The general commitment of 4-pole versions considerably reduces the product variety.

No PE-ground necessary

Due to DESINA® the PE-ground is not necessary in 24 V control circuits. This reduces cable cost.

Colored cables as function coding

Due to the colored cables, DESINA® makes a clear and uniform wiring structure possible – independent from the machine supplier. This makes service and maintenance easier. Murrelektronik always uses high quality and industry suitable cable.

Color	Description	Design
orange RAL 2003	Power cable , - i.e. servo drive, frequency - regulated actuations	specific design for the company
green RAL 6018	Transmitter cable i.e. measuring systems, analogue sensors	specific design for the company
violet RAL 4001	Bus/LWL cable i.e. field bus system, LWL-hybrid	2 x LWL and 4 x 1,5/2,5 mm ² , with port for T-splitter
yellow RAL 1021	Sensor/actuator cable i.e. proximity switches, magnet valves	4 x 0,34 mm ² , M12 on both ends, 5-pole pre-wired (without LED)
black RAL 9005	Power cable i.e. 3-phase motor, external	4 x 1,5 mm ² or specific design
grey RAL 7040	Signal cable i.e. 24 V signal/supply	multiple wire design (specific design)

Component diagnostic at sensors and valves

The diagnostic possibility of the single component is an important part of the DESINA® concept because the set-up and maintenance times are reduced. The sensor or actuator reports the error with a 0 V level at PIN 2 of the round plug connection.

For sensors and actuators without a diagnostic output, Murrelektronik offers the possibility to add this functionality with the help of an adapter. This simply makes it possible to recognize cable damages or miswired connectors.

Hybrid-field-bus technology

The main parts of the DESINA® concept include decentralization, modularization of the installation and an extensive diagnostic on the component level.

The hybrid-field-bus technology was specified to reduce the cost of wiring and to make faster set-up and maintenance possible.

The medium of transmission is the hybrid cable – power is transmitted via a copper cable, signals via an optical fiber cable.

The transmission via the optical fiber cable has two distinct advantages:

- universal usage – different bus protocols can be transmitted
- resistant to electromagnetic influences (EMC)

Hybrid-field-bus connection socket as an important interface

The hybrid-field-bus connector will make the conversion between IP20 (cabinet) and IP67 (field) independent of which Bus Protocol is being used. At the same time the interface serves also as the power supplier to the field equipments. Both unswitched 24 V DC for decentral periphery and switched 24 V DC for emergency signals are connected.

The terminal box version was conceived to connect decentral I/O-modules conforming to DESINA®. In addition, the hybrid-field-bus cable can be linked to other DESINA® components.

One hybrid-field-bus cable for all (bus-) cases

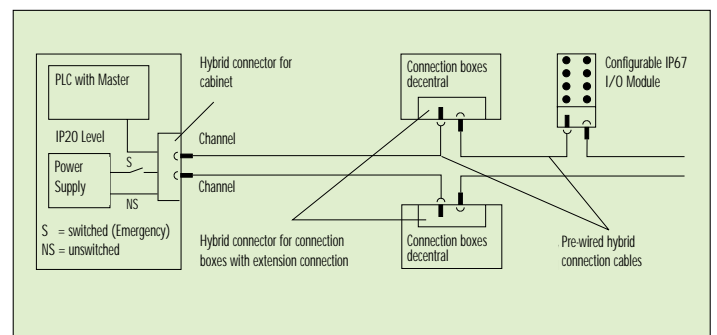
The fact that signal and power is transmitted in the hybrid cable saves time and space (just one cable has to be installed). The consequent plug-in connections make it possible to use pre-wired and tested cables. Mistakes in installation and downtime in service cases are reduced to a minimum.

Diagnostic hybrid-field-bus module

The new DESINA® field-bus module from Murrelektronik will have 8 digital ports, which can be configured. PIN 4 of each M12 port can be configured as an input or output. This is another step to keep the product variation of the I/O components to a minimum.

The ability of diagnostics is very important. Therefore PIN 2 of each M12 socket can be used as a diagnostic input. Due to error-detection in case of a fault and showing the error directly at the main terminal, downtime is reduced and the efficiency of the whole system is increased.

Applications example, schematic of the contacts



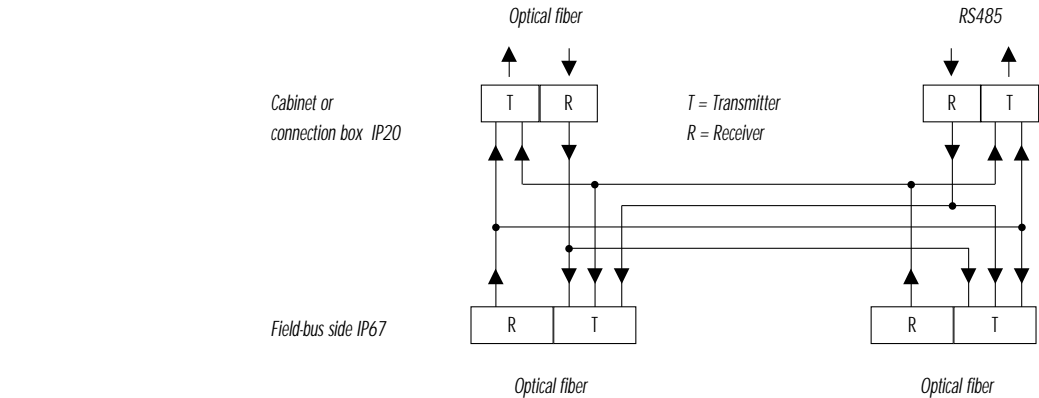
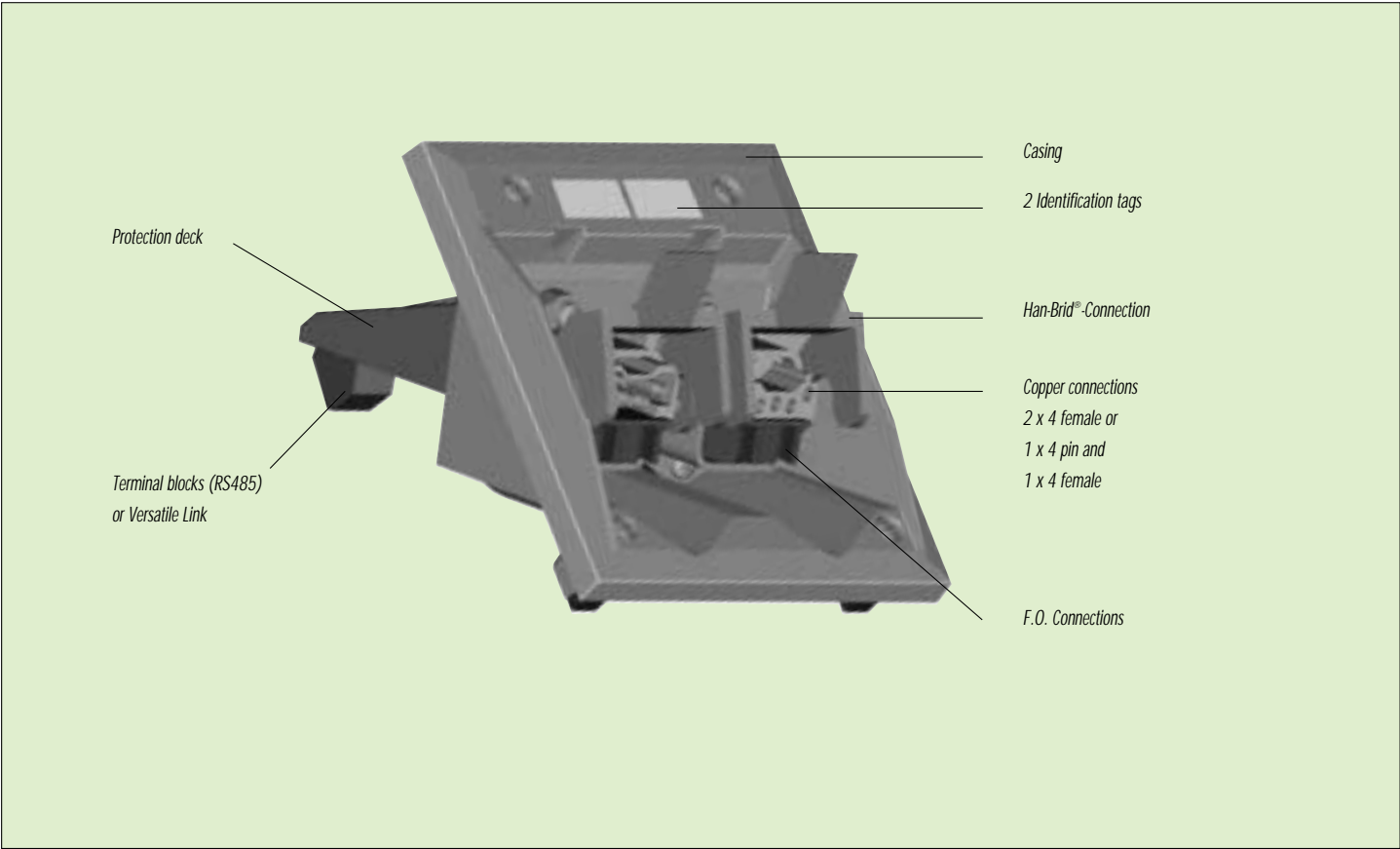
DESINA® hybrid-field-bus connection socket

This front panel interface unit ensures a safe connection from the cabinet or the terminal box (IP20) to the IP67 field-bus environment – independent of the bus protocol. The field-bus connection (optical signal transmitting/electrical power transmitting) is made via the IP67 protected hybrid-field-bus connector Han-Brid®.

The connection of the signals in the cabinet (IP20) is optical via Versatile Link components or electrical via a 9-pole Sub-Min-D-connector (RS 485).

The received signal from the field-bus is amplified and sent back to the field-bus side as an echo.

The power references "not switched" and "switched" (emergency circuit) are bridged internally between the clamp terminals (IP20) and the contacts. The electrical coupler is supplied from the "not switched" voltage.



Hybrid-field-bus connection socket

Optical signal (F.O.)
Electric signal (Copper)
with Han-Brid® Connector

Front panel interface for cabinet

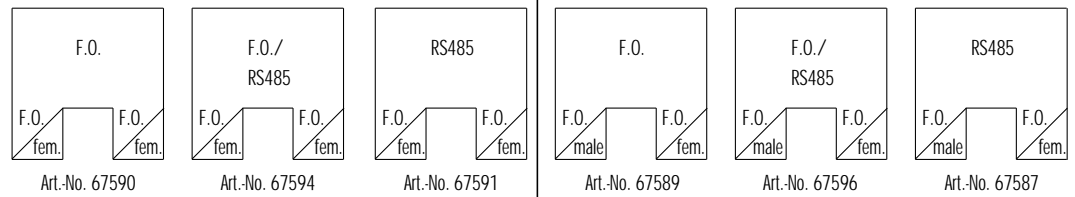
2 outputs to hybrid cables
power 2 x female



Front panel interface for connection box

pass through
power 1 x male, 1 x female

Circuit diagram



Ordering data

	Art.-No.	Art.-No.
Signal coupling (F.O.)	67590	67589
in cabinet / (F.O.) electrical (RS485)	67594	67596
connection box electrical (RS485)	67591	67587

Module supply

Input current (by 24 V) max. 200 mA, from unswitched internal power supply

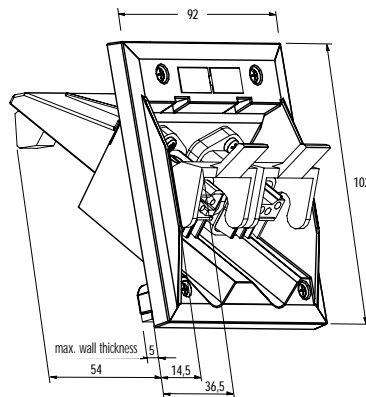
Connections

Supply voltage/ unswitched (NS)	24 V DC (20,4...31,2 V) / max. 10 A
Supply current switched (S)	24 V DC (20,4...31,2 V) / max. 10 A
F.O. Component	Versatile Link module for 1 mm fiber optical cable (POF), 200µm (HCS)
RS485 cabinet side	D-SUB 9-pole
Field-bus connection socket (IP67)	Han-Brid®
Power connection	cage clamp terminal block, flexible and high flexible cables 0,25...2,5 mm²

General data

Data rate	max. 12 Mbit/s
F.O. length / wave length	50 m (POF), 300m (HCS) / 650 nm
Temperature range	0...+60 °C
Protection	IP20 (cabinet), IP67 (field-bus)
Dimensions H x W x L	102 x 92 x 54 mm (cut out dimension H x W: 89 x 80 mm)
Material housing	flame retardant plastic, resistant against standard cooling agents and lubricants

Dimension drawing



Notes

Han-Brid® is a registered trade mark from HARTING KGaA

Pre-wired hybrid-field-bus connection cables

The hybrid-field-bus cable makes the connection between the PLC and the field-bus components. These components can be I/O modules with IP67 protection. Via the hybrid-field-bus sockets IP20 field-bus modules in decentralized terminal boxes can be triggered.

The DESINA® work group recognized the advantages of optical data transmission specially in harsh environments and therefore defined the hybrid-field-bus cable.

The transmission of the bus signals is made via polymer optical fibres (POF). The result is a resistance against electromagnetic influences from the outside. This is a big advantage for safety and for the availability of the machines. In addition different bus-protocols can be used.

Regarding the power transmission via copper strands the emergency functionality was considered. In addition to the non-switched 24 V supplied for the decentralized electrical, the switched voltage is taken over to guarantee a switch-off at the actuators in case of an emergency.

The PUR cable can be used in drag chains and is also resistant against standard coolants and lubricants. The violet color makes it easy for maintenance to find the cable even in complex machines. Plug-in connections on both sides of the cable can be changed quickly, saving time and money.



Hybrid-field-bus cable
Pre-wired cable F.O./Cu

Page 2.12.6



Connection adapters and cables
DESINA® connection adapters and cables for sensors, actuators and measuring systems

Connection adapters
Connection cables

Page 2.12.7
Page 2.12.8

Pre-wired hybrid-field-bus cable

Bus protocol through fiber optic cable (F.O.)

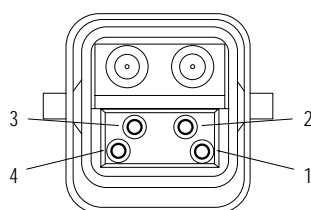
Power through copper cable



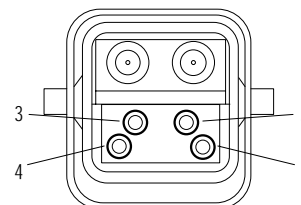
Pin arrangement

- 1: 24 V unswitched
- 2: 0 V unswitched
- 3: 0 V switched
- 4: 24 V switched

Male:



Female:



Ordering data

		Art.-No.
Cable length	2 m	55360
	5 m	55361
	10 m	55362
	15 m	55363

Technical data

Connection	Han-Brid®
Cable	DESINA® hybrid-field-bus cable F.O. + Cu
Signal transfer (F.O.)	
Connection	2 x Polymer Optical Fiber (POF)
Fiber type	PMMA 980/1000 µm
Attenuation	max. 200 dB/km by 650 nm
Isolation	PE, black numbered
Power transfer (copper)	
Connection	male: 4-pole pins, female: 4-pole socket
Conductor	4 x 1,5 mm², single wire 0,15 mm
Conductor jacket	PVC, black numbered
Nominal voltage	24 V DC
Supply current	max. 10 A
Cable	
Jacket	PUR, flame retardant, violet, RAL 4001
Outer diameter	approx. 10,0 mm
Bend radius	min. 8 x outer diameter, suit. for drag chains
Temperature range	fixed used -30...+70 °C, mobile used -5...+80 °C
Plug connector	
Protection	IP67 when plugged and screwed down
Temperature range	-40...+125 °C
Material	flame retardant plastic, resistant against standard cooling agents and lubricants

Notes

Han-Brid® is a registered trade mark from HARTING KGaA

MSUD/M12 Adapter
for valves
with wire-break diagnostic
or pressure switches

- integrated gasket
- label plate
- screw (cannot be lost)

M12 Adapter
for sensors/actuators
with wire-break diagnostic

Form A

Contact form 18 mm
M12 connector top entry

M12 connector at the rear

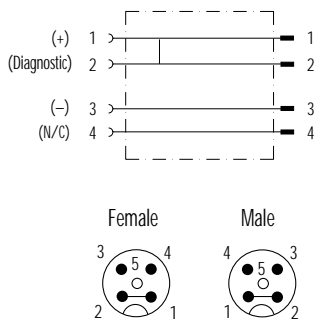
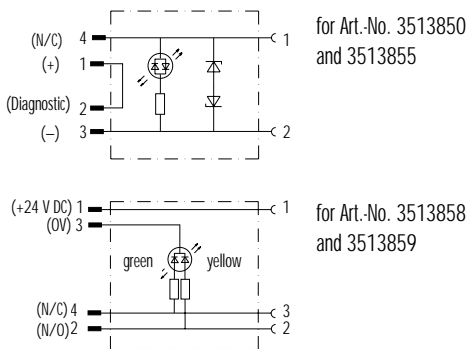


M12 Adapter

Female - Male
with bridge PIN 1 - PIN 2



Circuit diagram



Ordering data	Art.-No.	Art.-No.	Art.-No.
Version			
LED yellow, suppression for valves	3513850	3513855	
LED yellow/green for pressure switches		3513858	3513859
M12 Adapter			338008

Technical data	
Supply voltage	valve adapter 24 V AC/DC, pressure switches 24 V DC
Supply current	max. 4 A
Form	A to DIN 43650 (ISO 4400), contact form 18 mm
Suppression/Switch off spike	Z-diode/≤ 55 V (only at valve adapter)
LED Indicator: Color/current usage	yellow, or yellow/green / max. 15 mA
Connection	M12 x 1 round plug connector, 4-pole (pins)
Protection	IP 67 when plugged in and screwed down
Temperature range	- 25...+ 90 °C
Material	flame retardant plastic, resistant against standard cooling agents and lubricants
Dimensions	see dimension drawing

Dimension drawing		L x Ø 44 x 15 mm

Notes

**Male M12
with pre-wired cable**

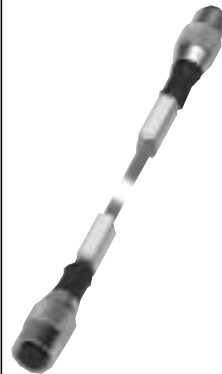
and

Female M12

Male straight
sensor/actuator cable
unshielded
yellow jacket

Male straight

Male straight
shielded cable
for measuring systems
green jacket



Female straight

Female 90°

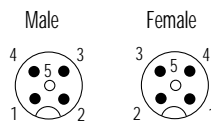
Female straight

Pin arrangement

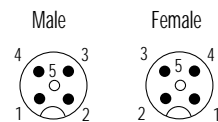
General:

Contact 1: (+)
Contact 2: (N/C/diagnostic)
Contact 3: (-)
Contact 4: (N/O)

4-pole
for N/O or N/C with diagnostic



4-pole
for N/O or N/C with diagnostic



Ordering data		Art.-No.	Art.-No.	Art.-No.
Connection cable	Cable length			
PUR	0,6 m	3533608	3533671	4533608
Wire diameter 0,34 mm ²	1,0 m	3533609	3533672	4533609
Identification FM yellow	1,5 m	3533610	3533673	4533610
Identification LY green	2,0 m	3533611	3533674	4533611
Technical data				
Supply voltage		24 V AC/DC (nominal voltage)		24 V AC/DC (nominal voltage)
Supply current		max. 4 A		max. 4 A
Connection		M12 round plug connector, 4-pole		M12 round plug connector, 4-pole with shielding
Cable		4 x 0,34 mm ² unshielded, suit. for drag chains		4 x 0,34 mm ² shielded, suit. for drag chains
Wiring		42 x 0,1 mm		42 x 0,1 mm
Jacket		PUR, yellow, RAL 1021		PUR, green, RAL 6018
Outer diameter		approx. 5,2 mm		approx. 5,9 mm
Protection		IP 67 when plugged in and screwed down		
Material	Housing	flame retardant plastic, resistant against standard cooling agents and lubricants		
Temperature range	Connector	- 25... + 90 °C		
	Cable	fixed use - 30... + 80 °C, mobile use - 5... + 70 °C		

Notes