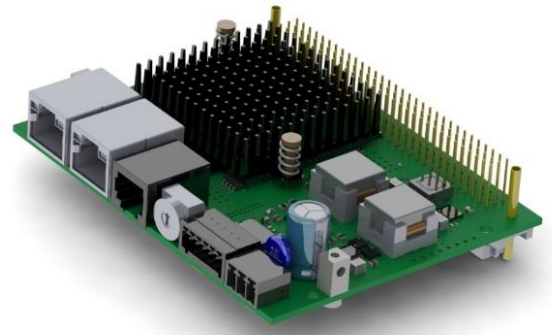


## 8. COP-MAS2 (Master 2nd Generation)

COP-MAS2                      6113475xx

The COP-MAS2 is the successor of the COP-MAS. Depending on its option, the COP-MAS2 is equipped with a single or dual core ARM Cortex-A9 processor. The COP-MAS2 is a universal CPU board to be used as a compact control unit. It can be operated either on a stand-alone basis or as a GinLink Slave. The master can communicate with up to six COP modules of any type. As the CPU board of a compact control unit, the master COP provides customer-specific machine software based on Indel's INOS real-time operating system. It controls and coordinates all peripherals: analogue and digital inputs and outputs, axes, counters, customer-specific electronics, etc. If the master COP is used as a fieldbus slave, it serves as an active bus coupler with its own CPU. The decentralised computing power can be used for signal pre-processing and the execution of customer-specific algorithms.



### 8.1. Technical Specifications

#### 8.1.1. Option 2x800M

The following technical specifications apply to the 2x800M option.

Processor		
Processor	ARM Cortex-A9	
Number of cores	2	
CPU clock	800	MHz
DDR RAM	256	MB
Flash PROM	8	MB
NVRAM	512	kB
Expandable memory	SD card adapter	
Floating point unit	Yes	
GinLink Master interfaces	<ul style="list-style-type: none"> <li>• 1 x 1GBit Ethernet</li> <li>• 1 x GinLink</li> <li>• 1 x serial RS232 or RS422/RS485 interface</li> <li>• 1 x serial TTL or RS422/RS485 interface</li> </ul>	
GinLink Slave interfaces	<ul style="list-style-type: none"> <li>• 2 x GinLink</li> <li>• 1 x serial RS232 or RS422/RS485 interface</li> <li>• 1 x serial TTL or RS422/RS485 interface</li> </ul>	
Maximum COP bus frequency	16	kHz

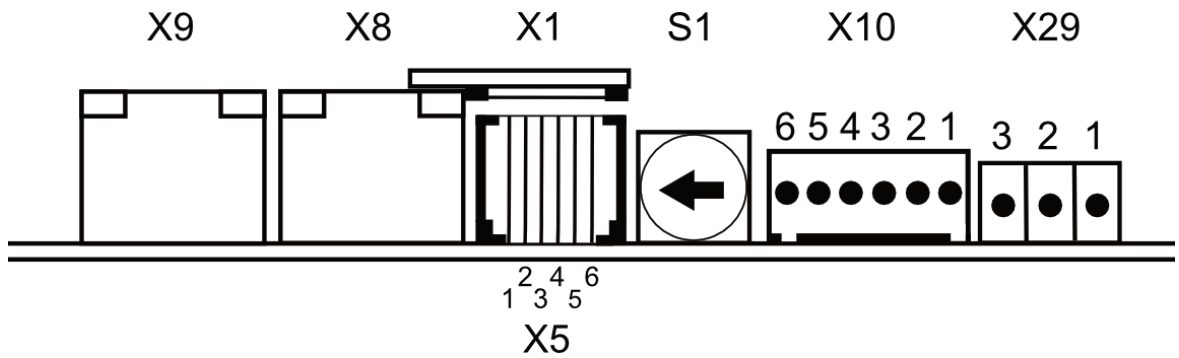
Logic Power Supply		
Rated voltage	24 -20% +30%	V <sub>DC</sub>
Fuse	8A, fast acting	
Module		
Maximum power consumption at 24V node power supply	300	mA

### 8.1.2. Option 800M/LITE

The following technical specifications apply to the 800M/LITE option

Processor		
Processor	ARM Cortex-A9	
Number of cores	1	
CPU clock	800	MHz
DDR RAM	256	MB
Flash PROM	8	MB
Floating point unit	Yes	
GinLink Master interfaces	<ul style="list-style-type: none"> <li>• 1 x 1Gbit Ethernet</li> <li>• 1 x GinLink</li> <li>• 1 x serial RS232 or RS422/RS485 interface</li> <li>• 1 x serial TTL or RS422/Rs485 interface</li> </ul>	
GinLink Slave interfaces	<ul style="list-style-type: none"> <li>• 2 x GinLink</li> <li>• 1 x serial RS232 or RS422/RS485 interface</li> <li>• 1 x serial TTL or RS422/Rs485 interface</li> </ul>	
Maximum COP bus frequency	16	kHz
Logic power supply		
Rated voltage	24 -20% +30%	V <sub>DC</sub>
Fuse	8A, fast acting	
Module		
Maximum power consumption at 24V node power supply	300	mA

8.2. Pin Assignment



Identification	Description
X9	GinLink in
X8	GinLink out/LAN <sup>1)</sup>
X1	SD card slot

1) The functionality of X8 varies depending on the switch setting (S1). See section 8.3.

Identification	Pin No.	RS232 Description	RS422/485 Description
X5 RJ12	1	Tx	nTx
	2	Rx	nRx
	3	DTR	pTx
	4	DSR	pRx
	5	GND	
	6	Earth/shield	

RS422/485: The braking resistor can be connected externally.

RS485: The RX and TX lines must be externally connected to each other.

Identification	Description
S1	Options rotary switch

Identification	Pin No.	TTL Description	RS422/485 Description
X10	1	Rx	pTx
	2	Tx	nTx
	3	-	nRx
	4	-	pRx
	5	5V	
	6	GND	

The braking resistor between 3 and 4 is 1200hm

RS485: The RX and TX lines must be externally connected to each other.

Identification	Pin No.	Description
X29 Power supply	1	24V
	2	GND
	3	Earth

### 8.3. Options Rotary Switch

You can use the options rotary switch to decide in which state the master is to be booted. The table below shows various states of the options rotary switch and available combinations.

Switch Position	Emergency system	GinLink Master 1)	LAN	Default IP	Description
0x0					Standard slave
0x1		x	x		Standard master or stand-alone
0x2		x	x	x	Master with default IP
0x3	x				Slave in the emergency system
0x4			x		Slave with debug LAN
0x5	x		x		Master/slave with debug LAN in the emergency system
0x6			x	x	Slave with debug LAN and default IP
0x7	x		x	x	Master/slave with debug LAN in the emergency system and default IP
0x8 ... 0xF	Reserve				

#### Emergency system

The master boots in the Indel emergency system.

#### GinLink Master

The COP-MAS2 also serves as a master GinLink. This allows for communication with other Indel modules via GinLink. This is the case when the COP-MAS2 is used as an applications master.

#### LAN

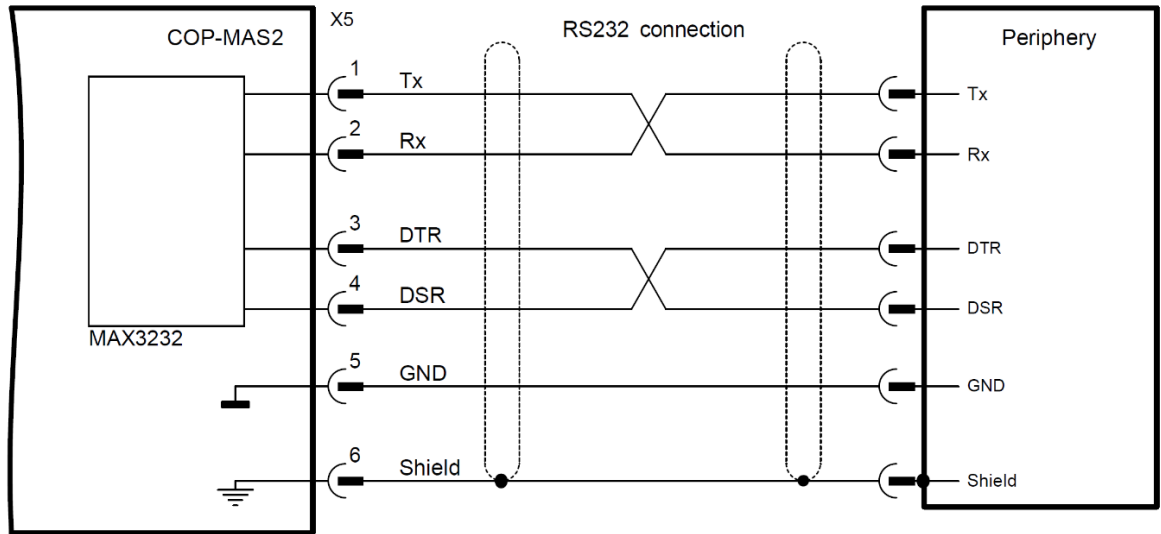
The GinLink out jack becomes a 1 GBit LAN interface. This allows for INCO communication with a host computer.

#### Default IP

By default, the master's IP (LAN interface) is 192.168.1.251.

8.4. Connection Examples

RS232



8.5. Available Options

The COP-MAS2 is available in two different options. They can both be operated on a stand-alone basis or as a master GinLink. The option 2x800M has a dual core ARM Cortex-A9 and is provided with a NVRAM and a SD card slot.

The option 800M/LITE is a COP-MAS2 with a single core ARM Cortex-A9 processor, without NV-RAM and a SD card slot.

Item Number	Label	Option	Description
611347505	COP-MAS2	2x800M	Dual core ARM Cortex-A9 800MHz, 8MB of flash memory, 256MB of RAM, 0.5MB of NVRAM, FPU, COP Master, 5VPS, 3.3VPS, GinLink Master/ GinLink Slave, SD card adapter, RS232, RS422/RS485 or TTL
611347500	COP-MAS2	800M/LITE	Single core ARM Cortex-A9 800MHz, 8MB of flash memory, 256MB of RAM, FPU, COP Master, 5VPS, 3.3VPS, GinLink Master, GinLink Slave, RS232, RS422/RS485 or TTL

8.6. Accessories

Item Number	Label	Option	Description
610839800	RJ-12 SIO adapter		Cable adapter for SIO between RJ-12 and D-Sub male, 20cm long