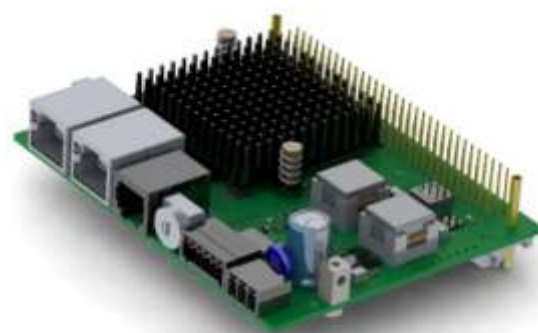


## 8. COP-MAS2 (Master 2nd Generation)

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 |

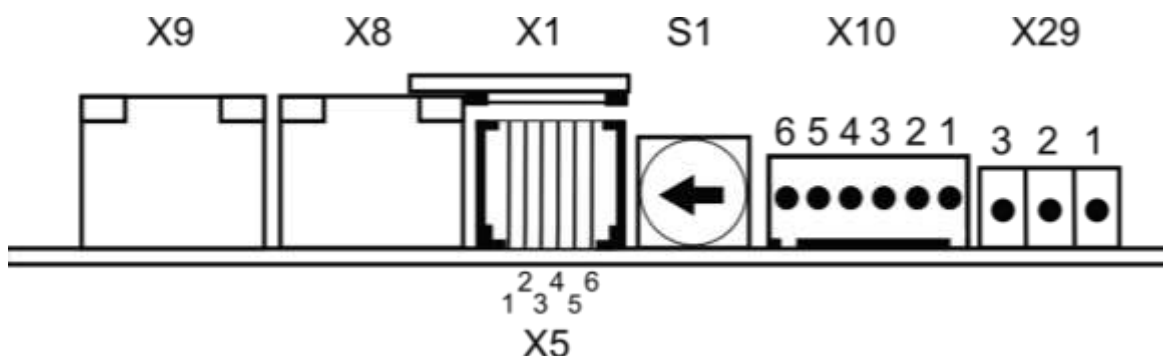
| Logic Power Supply                                 |                 |                 |
|----------------------------------------------------|-----------------|-----------------|
| Rated voltage                                      | 24 -20% +30%    | V <sub>DC</sub> |
| Fuse                                               | 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<br>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

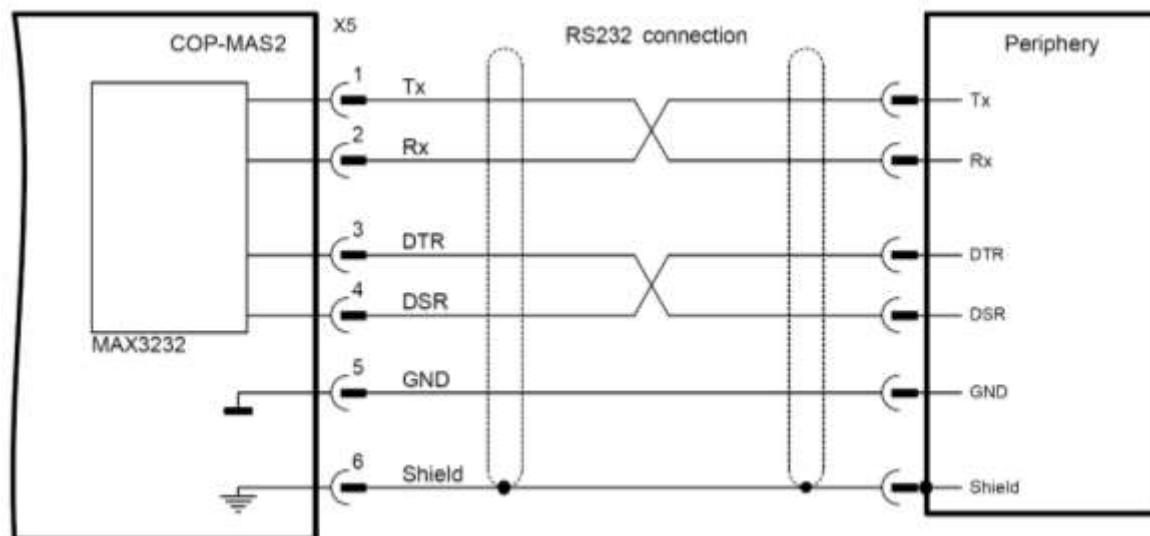
The GinLink out jack becomes a 1 GBit LAN interface. This allows for INCO communication with a host computer.

#### 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 |