

Ethernet communication adapter module with Modbus TCP/IP

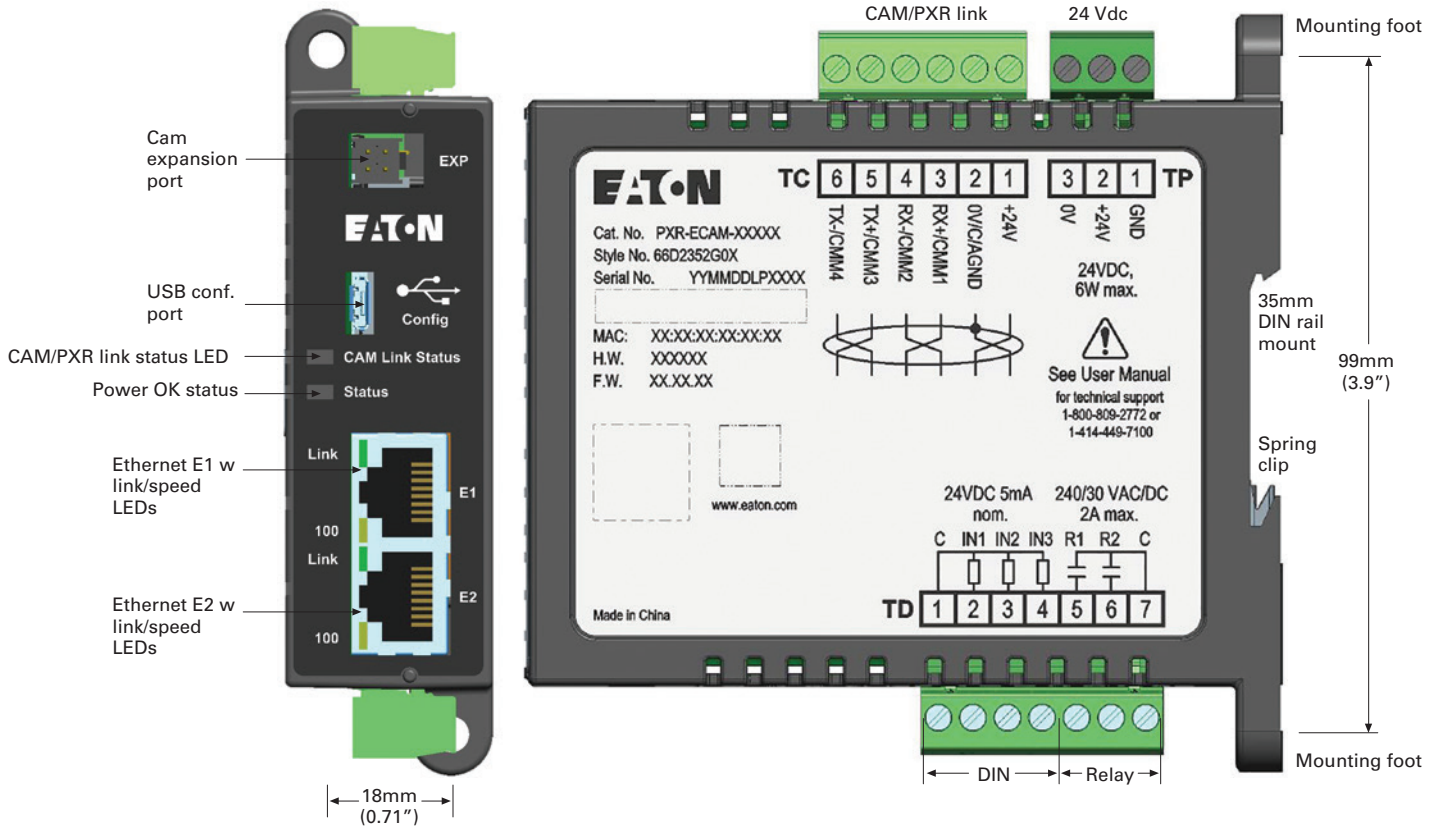


Figure 1. Left = front view, right = side view

For use with PXR 20/25 trip units for Series NRX and PXR 20/25 for molded case circuit breakers -The PXR-ECAM is designed to connect with a circuit breaker’s CAM-PXR link (CMM1-4, AGND/CMMC) and expand the communication capabilities into Ethernet Modbus TCP/IP and an HTML5 web interface.

The module also provides limited discrete IO and data storage relevant to the breaker. The module is to be mounted local to the breaker to keep the CAM-PXR link limited to 3m maximum length.

⚠ WARNING

Be sure that all power distribution power is off when commissioning a PXR-ECAM with a circuit breaker system. The module can be powered temporarily via the USB configuration port or permanently with the 24 Vdc power supply input.

⚠ IMPORTANT

Please refer to the PXR-ECAM User Manual MN013005EN for complete system detail.
www.eaton.com/cam

Catalog number	Ethernet protocol	Style #
PXR-ECAM - MTCP	Modbus TCP/IP	66D2352G01

PXR - ECAM ethernet communication adapter module specifications

- Weight: 0.36 lb.
- Housing width, height, length (30 x 111 x 111mm)
- Housing NEMA 1, IP20
- Pollution degree 3, pcb is conformally coated
- Operational/storage temperature: -20 to +70°C / -45 to + 85°C
- Elevation: 0 - 2000m, humidity 5 - 95% noncondensing
- CE mark, RoHS compliant
- Safety: IEC/EN/UL61010-1, UL file # E185559
 - CNL evaluation to CAN/C22.2 No 1010.1.92
- EMC EN61326 - IEC61000-4-X level 3
- Emissions: conducted and radiated
 - FCC part 15 & CISPR 11/22 class B

All terminal blocks are removable, 5.08 mm (0.200") and support wires of 0.2-2.03 mm² (24-14 AWG). Ferrules recommended for wire termination.

Power supply 24 Vdc +/- 20%, 6W maximum isolated CAM input power with common/0V clamped 300V to GND. Terminal identification "TP:1-3"

Ethernet -10/100 Base T/Tx RJ45 CAT5 (min.) STP interface dual ports E1 & E2, with shared MAC ID for daisy chain or ring topographies. Each jack supports link and speed LEDs.

DIN Three 24 Vdc +/-20% inputs externally wetted, shared common with ~5.0k ohm input impedance, 5mA draw. Terminal identification TD.1-4, shared with relay terminal.

DOUT -Two form A relays externally sourced, shared common hot 240 Vac/30 Vdc 2A CAT II max. Terminal identification TD.5-.7, shared with DIN terminal.

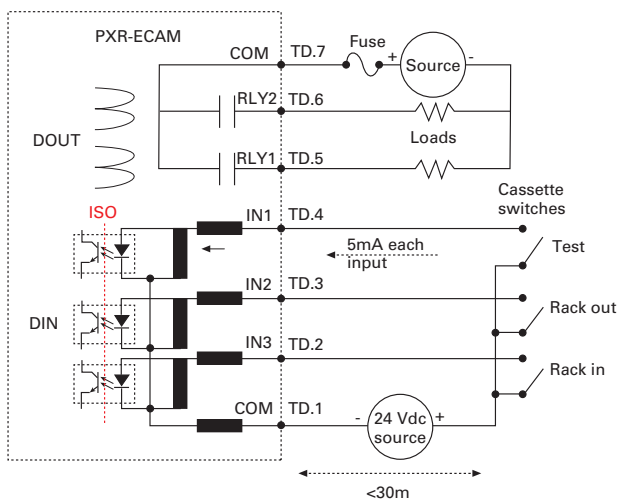


Figure 2. Discrete input and output connections

User interface

USB - Device interface full speed micro B serial port. USB host power will temporarily run the module for configuration purposes.

Status RED/GREEN LED

- Green on – power ok, 1Hz blink – normal mode
- Red on – application alarm active

CAM-PXR LINK RED/GREEN LED

- Green on – Active communications with ETU
- Red on – Communication alarm

Mounting – 35 mm DIN rail blade style or alternative panel mount with #8 or #10 screw. (see Figure 1)

CAM expansion port – An isolated expansion port for adjacent Eaton modules via short ~ 10cm cable.

CAM-PXR link - RS422 interface dedicated to interfacing with breaker electronic trip units (ETU). Isolated to CAM logic but common clamped at 300 Vdc to GND and electrically common with 24V return. Terminal identification I TC.1-6. Distance between ETU and module limited to 3m maximum, use shielded twisted pair cable. Shield should be an aluminized mylar with drain wire that doubles as the RS422 return/common. In ACB applications the ETU's Vaux power common (AGND) doubles as the RS422 return. The ECAM makes this connection internally and can bus power to the ETU as a third twisted pair off TC.1 & TC.2.

NOTE

The ETU and CAM power returns are electrically common.

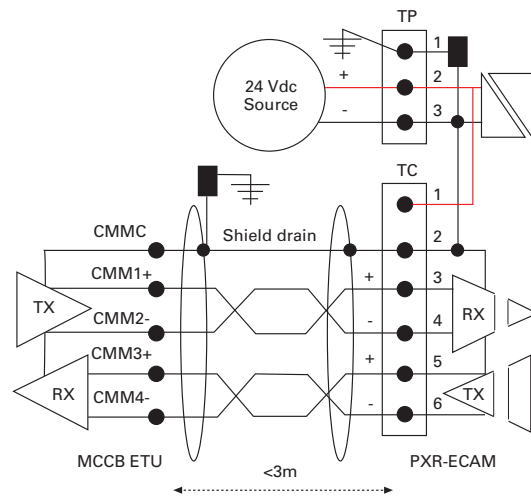


Figure 3. MCCB CAM-PXR link connections

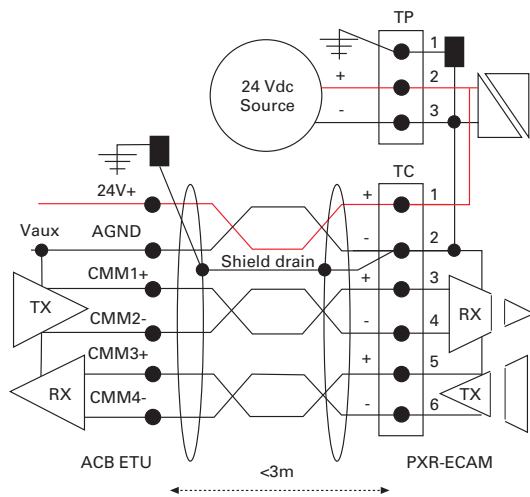


Figure 4. ACB CAM-PXR link connections

Network setup

The ECAM comes with the default IP address listed below but can also be setup for dynamic IP or user defined fixed address IP.

Default IP address is https://192.168.1.1
 Default user: admin
 Default password: Admin*1

Set your PC fixed IP address to 192.168.1.x. Browse to the default address listed above (works best in Chrome) and enter the credentials.

Password Security: Protecting your system from cyber security threats is important. The password should be changed upon installation of the ECAM (under the Settings->User Settings menu) and only made available to those individuals who require it.

Changing the factory default password is a key element of a comprehensive cyber security policy.

Browse to Settings-> App Settings->Network. Press Edit and select the desired method of IP allocation (see Figure 5). If using fixed full address then also check Mask and Gateway settings. Press Save when done and Edit again to close changes.

To use the new mode browse to App Settings. Press Edit then select Reboot device.

If dynamic (DHCP) was selected then you will need to navigate the display on the trip unit connected to the ECAM to see the new IP address. For example on PXR trip units:

Main Menu->Setting->Communication->Ethernet CAM. Alternatively, the USB port can be used to read the active IP address.

USB access

The USB Micro-B connection can be used to read and configure some settings using the Modbus protocol.

When the USB port is connected to a Windows® PC it is treated as a virtual serial port and appears in Device Manager Ports as a USB Serial Device (COMx) port. Driver Install: Retrieve LTK_USB_CDC.inf from eaton.com/CAM. Plug unit into PC USB port. In Device Manager->Other Devices right-click on LTK-USB and select Update Driver and Browse My Computer. Enter the path of the .inf file.

Select "Install this driver software." LTK USB Serial will show as completed.

Browse the Windows Device Manager and use the specified COMx (where x is a number such as 5 or 6 etc.) port as the serial port in the Modbus RTU application.

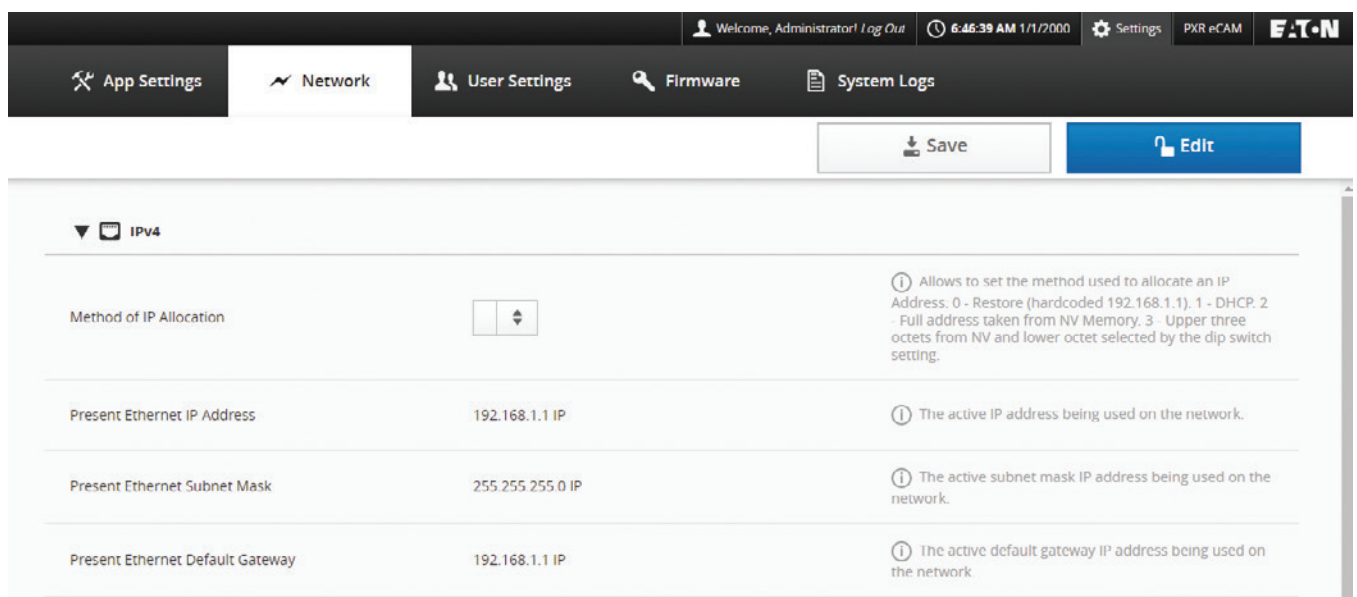


Figure 5. Network setup screen shot

Modbus access

The ECAM supports Modbus TCP using the Ethernet ports and Modbus RTU using the USB port. Using Modbus commands the ECAM can be used to read real-time parameters (current, voltage, power etc.), events (trip, alarm etc.) and setpoints from the connected trip unit.

You will need a Modbus RTU or TCP capable application such as ModScan or ComTestPro which act as the Modbus master and the ECAM is the Modbus slave. Read operations use Modbus function code 3. Write operations use function code 16.

Certain Modbus registers are listed below. The device address to use is 1. Consult document IL0131127EN for the full ECAM Modbus map.

Register address	# regs	R/W	Description
25665	2	R	Active IP address ex: 0101h COA8h = 192.168.1.1
25771	1	R/W	IP address allocation method: 0 = default 192.168.1.1 1 = DHCP 2 = static fixed
25776	2	R/W	Write or read IP address for allocation method = 2. same format as 25665

Inputs

The DIN digital inputs can be monitored using the UI and read via Modbus registers.

From your browser select the I/O tab to see the states of input 1, 2 & 3. There is also the mode button that allows display of the states as general (On/Off) or breaker mode (Racked In/Out State). The mode can only be changed by admin role users.

Outputs

The DOUT output relays (R1, R2) are controllable from the UI or Modbus register writes.

From your browser select the I/O tab access the output controls output 1 and output 2. There is also the mode button that allows mode selection as general or breaker mode. The mode can only be changed by admin role users.

In breaker mode the relays work as a unit where a close command closes relay 1 for ~.5 seconds while relay 2 is held open. An open command closes relay 2 for ~.5 seconds while relay 1 is held open.

In general mode the two relays can be individually latched closed or open.

WARNING

Do not connect the relay outputs to the circuit breaker open and close circuits unless remote control is specifically intended and the process for issuing the remote Open/Close is restricted, controlled and has been safety evaluated/approved.

WARNING

Never connect the relay outputs to the circuit breaker open and close circuits when the relay outputs are intended for general purpose operation.

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Publication No. IL0131132EN / VCG
December 2017

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