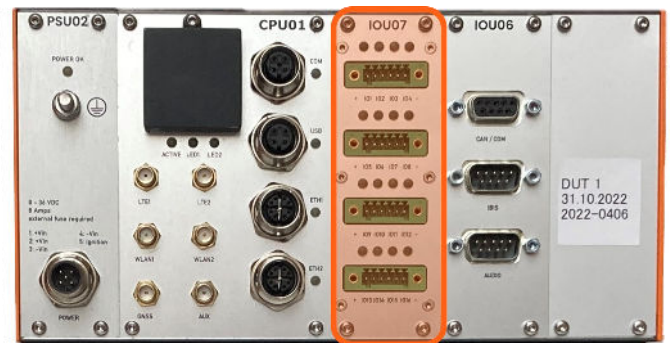# ModuCop Extension IOU07

Digital I/O extension unit (ModuCop) for edge applications in trams & buses

Features

- 1 slot (7 HP) extension unit for ModuCop Edge Computer
- 16 digital inputs / outputs (selectable) via 4x 6-pin spring terminal; 24V DC (nom)
- Integrated diagnosis: Output watchdog, protection for overcurrent & reverse polarity, short circuit proof
- Configurable modes for usage as direct I/O or data logger with multiple data streams.
- Galvanic isolation in groups of 4 I/Os
- Status LED for each I/O
- EN 50155 compliant; UN-ECE R10 (E-Mark) (integrated in ModuCop)

Introduction

The *IOU07* extension unit upgrades ModuCop Edge Computer by flexible usable binary inputs and outputs.

IOU07 offers 16 general purpose inputs / outputs designed as switches to read status of discrete signals as well as control external equipment. The usage of each I/O (type, high side, low side) depends simply on the external circuitry and SW configuration.

IOU07 provides four galvanically isolated groups by 4 I/Os each. The IOU07 I/Os are designed as switches in 24V systems, need at least 11,5V external voltage. Outputs allow 150mA per output; Input signals can be measured by up to 500 Hz frequency.

IOU07 is powered by ModuCop integrated power supply and controlled by ModuCop CPU unit.

IOU07 is fully supported by Ci4Rail's Linux Microservices Platform, running on ModuCop.

Applications

- Board computer (OBU)
- Control and measurement applications
- Diagnosis systems
- Condition-based monitoring
- Predictive maintenance

Software

IOU extension products are easily integrated into applications through standardized, platform and programming language independent protocols (Protobuf and TCP).

They are supported by open source client libraries that provide APIs for common programming languages.

API functions include:
- Interface configuration, e.g. setting the sampling frequency.
- Direct interaction with the interface, e.g., retrieving/setting current values of a binary I/O
- Defining and receiving one or more streams of time-stamped samples

ModuCop Extension IOU07

Specifications

Input/Output	S101-IOU07-
Binary Input / Output	16 IN/OUT via 4x 6p spring terminal
Binary Input characteristics	24 DC (nom) IEC61131-2 type 1 and 3 input Threshold 6.7/8V Max. input frequency: 500 Hz
Binary Output characteristics	24 DC (nom) - high side or low side switching Current limit per pin 200mA (typ) (high side switch) Current limit per pin is 150mA (typ) (low side switch) Max. output frequency: 20 Hz max. capacitive load: 25 µF @ 20 Hz switching frequency per pin; max. inductive load: 320 mH @ 20 Hz switching frequency per pin
Binary I/O diagnosis	Watchdog; pin current limit; pin or group overload group supply voltage absent; group supply undervoltage;
Binary I/O configuration	Operation mode configurable by software per pin
Galvanic isolation	750V DC / 5 Groups
Power Input	Via ModuCop System
Mechanics	
Dimensions	1 Slot (ModuCop System); 7 HP
Installation	ModuCop Extension Slot
Environmental*	
Operating Temperature	-40...+70°C / 85°C (10min) (EN 50155:2021 – OT4 + ST1)
Storage Temperature	-40...+85°C (EN 50155:2021)
Humidity	95% (EN 50125-1:2014)
Altitude	3000 m max. above sea level (EN 50125-1:2014, class AX)
Shock / Vibration	EN 61373:2010; Cat. 1; Class B
EMC Emission / Immunity	Rail Applications: EN 50121-3-2:2016; EMV 06 (2.0) Class S1; EN 301 489-1 (V2.2.3) Automotive Applications ECE R10 Rev.5
Safety	EN 50155:2017; EN 50153:2014+A1:2017; EN 50124-1:2017; EN ISO 13732-1:2008
Fire&Smoke	EN 45545-2:2013 + A1:2015; HL3
Useful Life	20 years (EN 50155:2021, class L4)
Pollution Degree	PD2 (EN 50124-1:2017)

* All environmental data apply for proper installation in ModuCop Edge Computer.

Order Information

The product can only be ordered as integrated I/O extension unit in ModuCop Edge Computer.

Accessories

N/A