Peridect+

system description and RFI/RFP data

Contents

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1. System introduction

Perident+ is a perimeter intrusion detection system that detects vibrations caused by mechanical impulses arising from attempts to climb, cut through or crawl under the fence. It can be installed on different types of fences such as mash fence, welded fence, trapezoidal metal sheets or wall fence superstructure. **Perident+** is able to detect attempts to manipulate with detectors and interruption or short-circuit on the cable. It is an IP-based system that fully complies with established network and video standards.

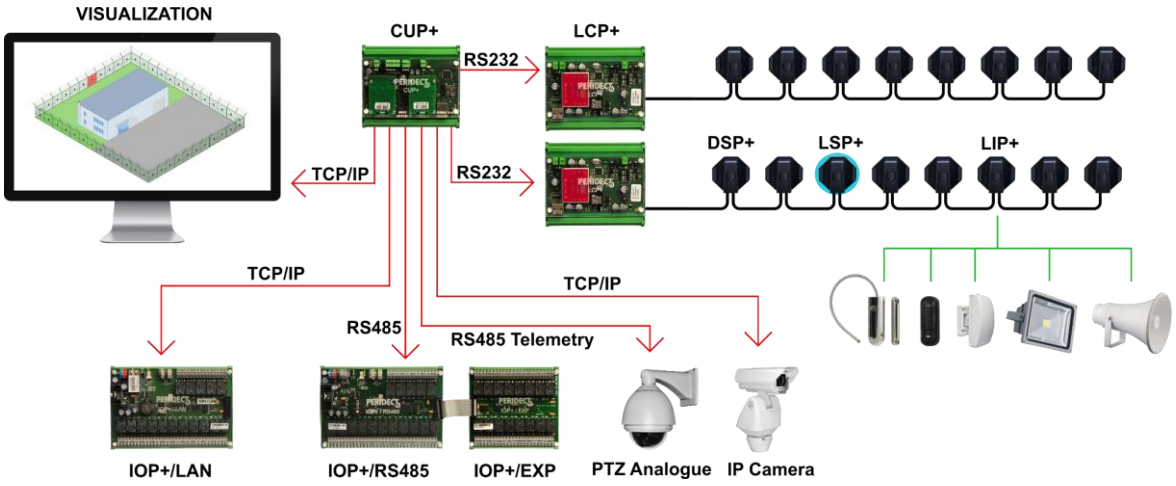
2. System architecture

Perident+ consists of :

Evaluation units
- **CUP +** (Control unit) with integrated LAN port, RS485 bus, 4x logic outputs, 1 input (tamper)
- **LCP+** (Line controller unit) with galvanic isolation and up to 500 addresses for symmetrical two-wire detection line (one CUP+ can handle one or two LCP+)

Detection line
- **DSP+** (Detection Sensor) - piezoelectric vibration sensor
- **LIP+** (Line I/O module) - 2 x double balanced input, 1 x output (up to 128 inputs/outputs per CUP+)
- **LPP+** (Line Protection Module) - overvoltage protection
- **LSP+** (Line Separator Module) - protection against short circuit with included overvoltage protection (up to 20 separators per line)

Additional modules
- **IOP+/LAN** (I/O Relay Module LAN interface) - 16x relay output, 2x double balanced input
- **IOP+/RS485** (I/O Relay Module RS485) - 16x relay output, 2x double balanced input
- **IOP+/EXP** (Expansion module for IOP+/LAN and IOP+/RS485) - 16x relay output



Pic. 1 - Typical system architecture example

3. System description

Intrusion detection of Peridect+ is based on addressable detectors DSP+ that are mechanically fitted to the fencing (incl. gates) in the following way: One detector per one fence panel. One detector per each fence field guarantees the accuracy of the system.

Pic. 2 – Detectors fitting example

Through two-wire communication bus (data and power), the detectors are connected in parallel to each other and to the **line controller LCP+.** Up to **500 addresses** can be connected to **one detection line controller LCP+**. These addresses can be assigned to a combination of:

- DSP+ detectors
- LIP+ line input-output modules to connect 3rd party systems (magnetic contact, PIR etc.)

Other modules that are not occupying an address are:

- LSP+ line separators modules to isolate a short circuit on the line (overvoltage protection icluded)
- LPP+ overvoltage protection modules

Maximum lenght of the 2-wire detection line shall not exceed 1500m including all installation additions (e.g. cables hidden inside detectors) and cables connecting the first detector with LCP+ module!

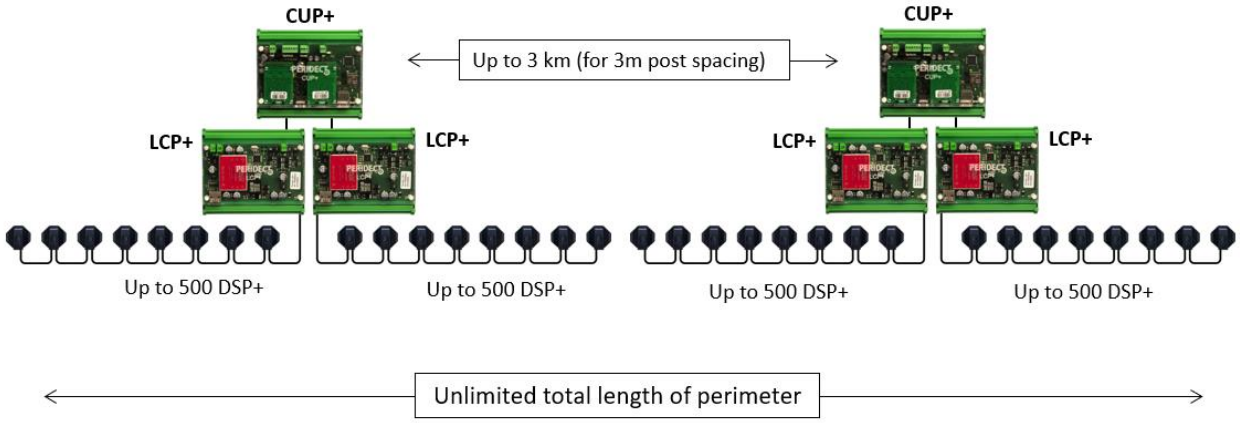
The core of the system is the **CUP+** (control unit), that is responsible for:

- Evaluation of data received from detectors including false alarm elimination algorithms
- Configuration storage and back-up
- Log records
- TCP/IP based communication with visualisation software and 3rd party systems (e.g. IP cameras).
- RS485 communcation with 3rd party systems (e.g. analogue cameras)
- Inputs/outputs control

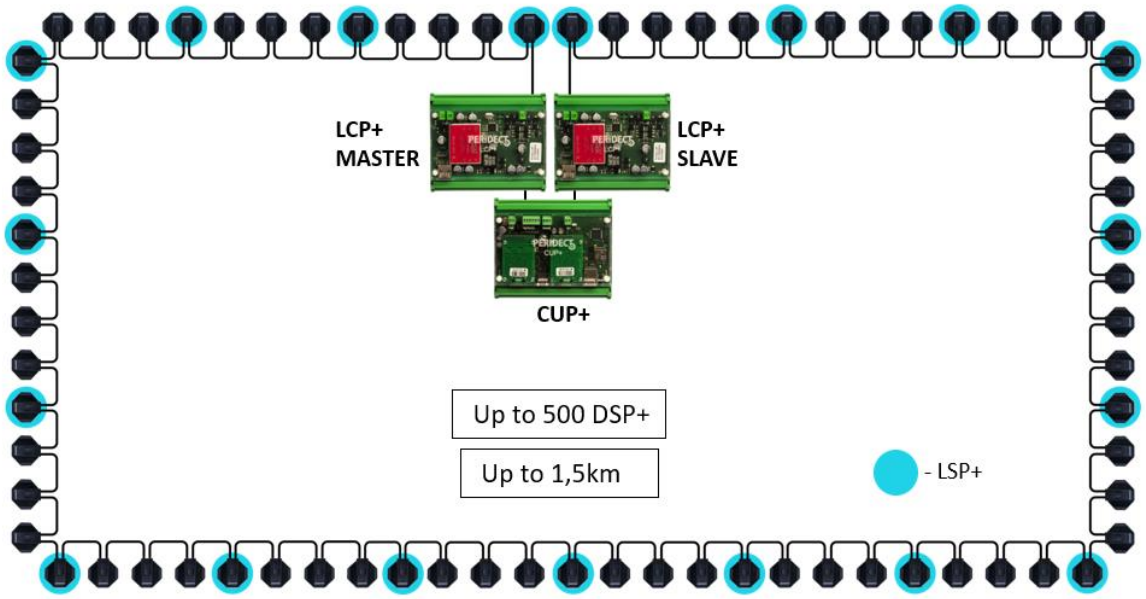
One CUP+ can be connected to two LCP+ units, so a total number of addresses per one CUP+ is **1000** (2x 500). CUP+ is equipped with a **ETH** (LAN) and **RS485** ports, **1 input** and **4 outputs**. The number of inputs/outputs can be expanded with additional I/O relay modules connected via LAN or RS485 (IOP+).

In case you use two LCP+ units in **Master/Slave regime** Peridect+ supports a ring connection that can be used for system back up in case of detection line interruption or a short circuit. In case of the ring connection the number of addresses per one CUP+ is 500. (is equal to number of adresses of one LCP+).

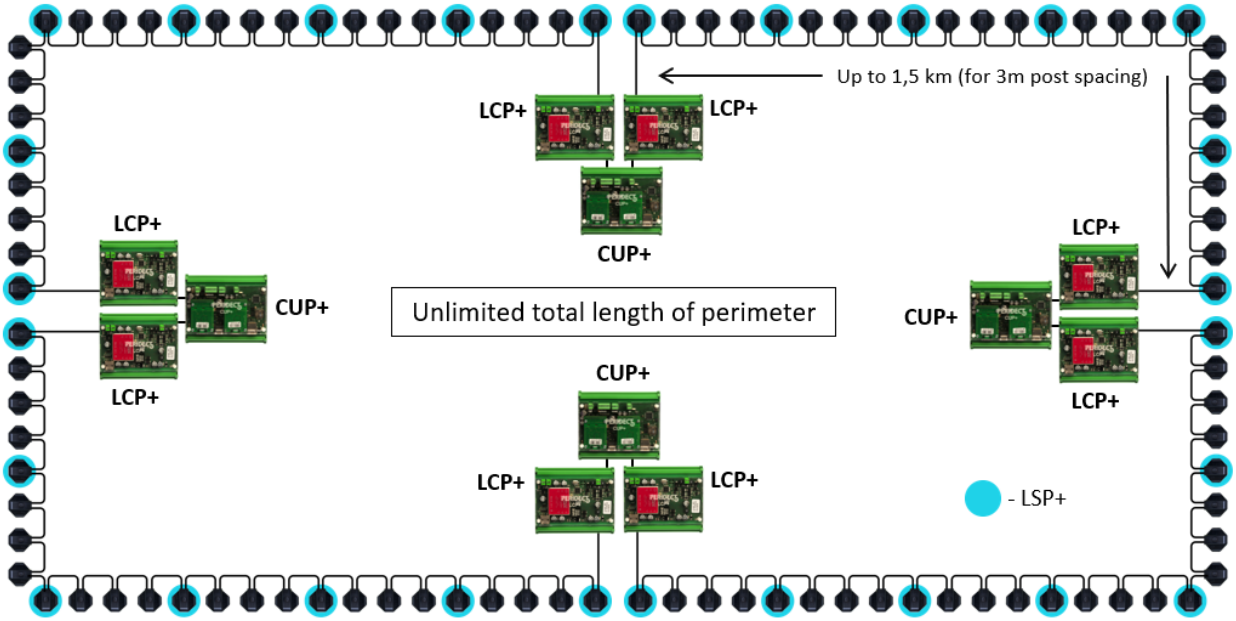
3.1 Typical installation examples



Pic. 3 – Simple detection line installation example



Pic. 4 – Basic ring redundancy installation example



Pic. 5 – Advanced ring redundancy installation example

3.2 Peridect+ detection line versions

- **Peridect+ Standard**
  - Optionally supplied with detectors connected from manufacturer‘s production
  - UV resistant two-wire cable for outdoor use

- **Peridect+ Antivandal**
  - Cable protected by stainless steel tube
  - Protection against mechanical damage and electromagnetic interference

- **PERIDECT+ Hidden**
  - Invisible detection system
  - Detectors installed inside posts
  - Supplied disassembled

Pic. 6 – Standard, antivandal and hidden detectors

3.3 Key features of Peridect+

Peridect+ detects an intruder directly on the boundary of the protected area and gains sufficient time for the security operator for an effective reaction. It brings lower risk and higher prevention of larger damage than intrusion detection inside the protected site.

- **Extremely low false alarm rate**
  - With a unique algorithm that compares data from neighboring detectors, Peridect+ dramatically reduces false alarms caused by weather conditions like rain, wind, hail and lightning.

- **Cost effective solution**
  - One control unit CUP+ (with two line controllers LCP+) cover up to 3 km of your perimeter. Cascading CUP+ units allows you to protect theoretically unlimited lenght of your fence. Maintanance like detector or cable replacement is extrmely fast (typical MTTR < 1h).

- **Native integration with IP cameras**
  - In case of intrusion detection, the external IP PTZ camera is automatically directed to move to the intrusion area for two-step verification.

- **Modularity**
  - Modular architecture of Peridect+ allows easy modification and system extension in the future. Each individual sensor is addressable.

- **Detection accuracy**
  - Thanks to addressable vibration sensors fitted at each fence panel, Peridect+ supports very high detection accuracy – typically 3m.

- **Symetrical connection of detectors**
  - A symmetrical two-wire connection simplifies installation of the system because it is not necessary to follow the polarity of the wires. It also increases system resistance to EMI.

- **Redundancy**
  - Ring connection with one control unit and two line controllers (master/slave) can be used for system back up in case of detection line interruption or a short circuit.

- **Galvanic isolation of detection line**
  - Each detection line is galvanically isolated from the CUP+ unit. This provides much higher electomagnetic immunity.

- **Antivandal solution**
  - Stainless steel tube for cables increases protection against mechanical damage and electromagnetic interference.

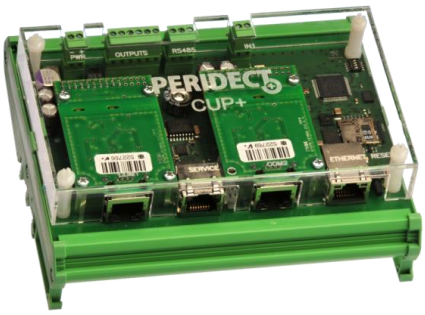
- **Integration with 3rd party systems**
  - Programmable I/O modules and TCP/IP based API is available for integration.

4. HW specification

4.1 CUP+ (control unit)

processes the signals from LCP+ units. It evaluates the events of the individual detectors based on an internal algorithm and subsequently controls related actions, inputs switching, camera control and sending data into the superstructures SW.

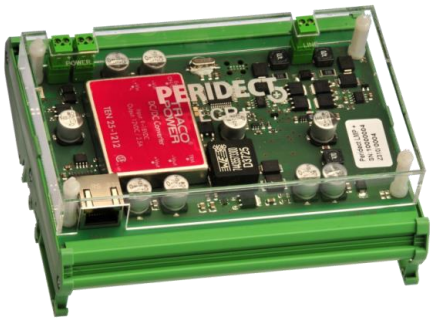
- **Supply voltage**: 9 – 16 VDC
- **Consumption**: 160 mA
- **ETH port:** for connecting CUP+ to the data network
- **RS 232:** 2x used for connection of the LCP+ modules
- **RS485:** port for analogue cameras and IOP+ modules connection
- **Input:** 1x logical input (NC)
- **Output:** 4x open collector output
- **Micro SD slot:** for saving logs and configuration
- **Protection**: IP20 rated
- **Operational temperature range**: -25°C to +60°C
- **Dimensions**: 150 x 100 x 40 mm
- **Holder**: DIN



4.2 LCP+ (line controller unit)

powers and controls all modules on the detection line (DSP+, LIP+, LSP+, LPP).

- **Supply voltage**: 9 – 16 VDC
- **Consumption**: max 350 mA
- **RS 232:** used for connection to CUP+
- **Detection line**: 2-wire, max 36V/0,5A
- **Protection**: IP20 rated
- **Operational temperature range**: -25°C to +60°C
- **Dimensions**: 150 x 100 x 40 mm
- **Holder**: DIN



4.3 DSP+ (detector)

- **Power supply:** powered from the LCP+ detection line connector
- **Consumption**: less then 1mA per detector
- **Protection**: IP65 rated
- **Operational temperature range**: -60°C to +85°C
- **Dimensions:** 50 x 30 x 20 mm (outer casing 110 x 110 x 40 mm)

4.4 LIP+ (input/output module)

is used for connecting an external device located on the detection line. Up to 128 inputs and 128 outputs can be used per one CUP+. (So 64 LIP+ modules can be installed, if both inputs of one LIP+ are used; 128 LIP+ modules if one LIP+ input is used). LIP+occupies one address (from 500 addresses) per LCP+.

- **Power supply:** powered from the LCP+ detection line connector
- **Consumption**: max 2mA
- **Input**: 2x double-balanced (balancing resistors of 2 x 2k2 and 1 x 4k7)
- **Output**: 1x open collector
- **Protection**: IP65 rated
- **Operational temperature range**: -60°C to +85°C
- **Dimensions:** 50 x 30 x 20 mm (outer casing 110 x 110 x 40 mm)

4.5 LSP+ (line separator module)

is used to detect short circuit on the detection line. LSP+ includes an overvoltage protection. In case of a short circuit, the part of the detection line between two separators is disconnected while the rest of the line remains operational. Max. number of connected LSP+ on one LCP+ is 20, no address on LCP+ ocuppied.

- **Power supply:** powered from the LCP+ detection line connector
- **Consumption**: less then 1mA
- **Protection**: IP65 rated
- **Operational temperature range**: -60°C to +85°C
- **Dimensions:** 50 x 30 x 20 mm (outer casing 110 x 110 x 40 mm)

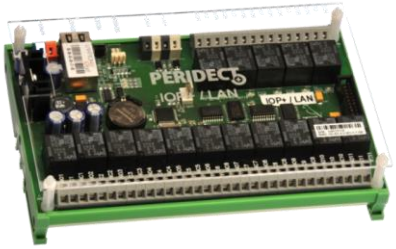
4.6 LPP+ (line overvoltage protection)

is used to increase the resistance to electromagnetic field and lightning bolts. No address on LCP+ occupied. **It is recommended to install one LPP+ per 25 DSP+ (detectors).**

- **Power supply:** powered from the LCP+ detection line connector
- **Consumption**: less then 1mA
- **Protection**: IP65 rated
- **Operational temperature range**: -60°C to +85°C
- **Dimensions:** 50 x 30 x 20 mm (outer casing 110 x 110 x 40 mm)

4.7 IOP+/LAN (external input/output module)

is used for connecting an external device located anywhere on the LAN network. Up to 32 inputs and 128 outputs can be used per one CUP+.

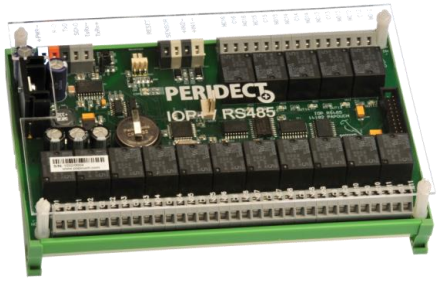


- **Supply voltage**: 9 – 16 VDC
- **Consumption**: 120 mA (620 mA at all relays switched on)
- **ETH port:** for connecting to LAN network
- **Input**: 2x double-balanced (balancing resistors of 2 x 2k2)
- **Output**: 16x relay (60V AC or 85V DC recommended)
- **Operational temperature range**: -25°C to +60°C
- **Protection**: IP20
- **Dimensions**: 190 x 130 x 50 mm
- **Holder**: DIN

4.8 IOP+/RS485 (external input/output module)

is used for connecting an external device located at the same location as CUP+. Up to 32 inputs and 128 outputs can be used per one CUP+.

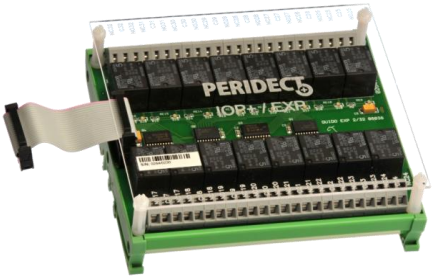
- **Supply voltage**: 9 – 16 VDC
- **Consumption**: 120 mA (620 mA at all relays switched on)
- **RS485:** for connecting to CUP+
- **Input**: 2x double-balanced (balancing resistors of 2 x 2k2)
- **Output**: 16x relay (60V AC or 85V DC)
- **Operational temperature range**: -25°C to +60°C
- **Protection**: IP20
- **Dimensions**: 190 x 130 x 50 mm
- **Holder**: DIN



4.9 IOP+/EXP (expander module)

is used to increase the number of conneced external devices located at the same location as CUP+. Total number of outputs per one CUP+ can not exceed 128.

- **Supply voltage**: 9 – 16 VDC
- **Consumption**: 50 mA (500 mA at all relays switched on)
- **Output**: 16x relay (60V AC or 85V DC recommended)
- **Operational temperature range**: -25°C to +60°C
- **Protection**: IP20
- **Dimensions**: 140 x 130 x 50 mm
- **Holder**: DIN



5. Integration with 3rd party systems

Perident+ supports following options for integration:

5.1 TCP/IP based API

Provides a full control of the system according available API description. The same API is used for Perident+ configuration tool or by 3rd party superstructure SW.

5.2 TCP or UDP strings

Configurable strings (128 characters) are sent according to following system statuses:

- Prealarm
- Alarm
- Logical input alarm
- Log. Input sabotage
- LIP+ sabotage
- LIP+ alarm
- LIP+ missing
- LCP1 Error
- LCP2 Error
- TCP Error
- Ethernet Error
- Onvif Error
- Real Time Clock Error
- Temperature 1 error
- Temperature 2 error
- DSP on LCP1 Error
- DSP on LCP2 Error
- LCP1 Active
- LCP2 Active
- LCP1 Designated Slave
- LCP2 Designated

5.3 RS485 based strings

Configurable strings (128 characters) are sent according to following system statuses:

- Prealarm
- Alarm
- Logical input alarm
- Log. Input sabotage
- LIP+ sabotage
- LIP+ alarm
- LIP+ missing
- LCP1 Error
- LCP2 Error
- TCP Error
- Ethernet Error
- Onvif Error
- Real Time Clock Error
- Temperature 1 error
- Temperature 2 error
- DSP on LCP1 Error
- DSP on LCP2 Error
- LCP1 Active
- LCP2 Active
- LCP1 Designated Slave
- LCP2 Designated Slave

5.4 Logical outputs

Open collector based outputs are located on the detection line. Follow, pulse, time and delay behavior can be set up according to following system statuses:

- Prealarm
- Alarm
- Logical input alarm
- Log. Input sabotage
- LIP+ sabotage
- LIP+ alarm
- LIP+ missing
- LCP1 Error
- LCP2 Error
- TCP Error
- Ethernet Error
- Onvif Error
- Real Time Clock Error
- Temperature 1 error
- Temperature 2 error
- DSP on LCP1 Error
- DSP on LCP2 Error
- LCP1 Active

- LCP2 Active
- LCP1 Designated Slave
- LCP2 Designated Slave

5.5 Relay outputs

Relay based outputs are located on LAN or RS485 bus. Follow, pulse, time and delay behavior can be set up according to following system statuses:

- Prealarm
- Alarm
- Logical input alarm
- Log. Input sabotage
- LIP+ sabotage
- LIP+ alarm
- LIP+ missing
- LCP1 Error
- LCP2 Error
- TCP Error
- Ethernet Error
- Onvif Error
- Real Time Clock Error
- Temperature 1 error
- Temperature 2 error
- DSP on LCP1 Error
- DSP on LCP2 Error
- LCP1 Active
- LCP2 Active
- LCP1 Designated Slave
- LCP2 Designated Slave

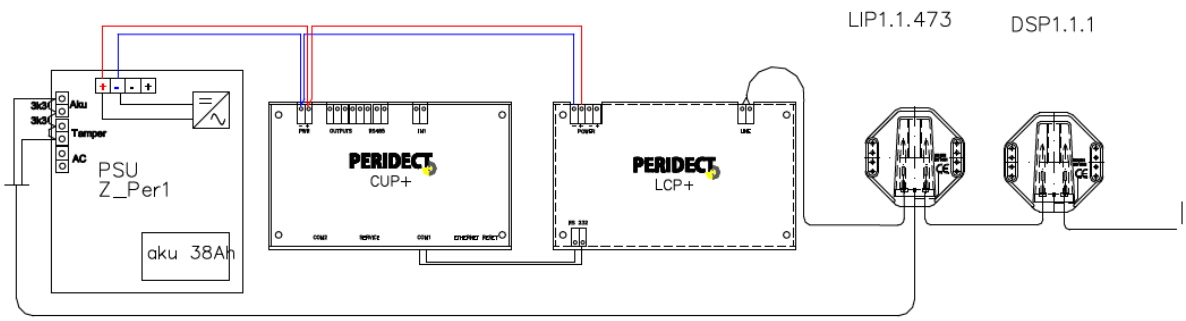
5.6 Cameras (analogue and IP)

Up to 128 IP cameras can be directly commanded (typically parked to the particular preposition) by ONVIF S protocol (TCP/IP), by Pelco D and Pelco P protocols (RS485) or by TCP/UDP/RS485 strings according to following system statuses:

- Prealarm
- Alarm
- Logical input alarm
- Log. Input sabotage
- LIP+ sabotage
- LIP+ alarm
- LIP+ missing
- LCP1 Error
- LCP2 Error
- TCP Error
- Ethernet Error
- Onvif Error
- Real Time Clock Error
- Temperature 1 error
- Temperature 2 error
- DSP on LCP1 Error
- DSP on LCP2 Error
- LCP1 Active
- LCP2 Active
- LCP1 Designated Slave
- LCP2 Designated Slave

6. **Others**

Examples of CUP+, LCP+, DSP+ and LIP+ connection are available in pdf or dwg on request.



Pic. 7 – dwg examples of CUP+, LCP+, DSP+ and LIP+ modules connection