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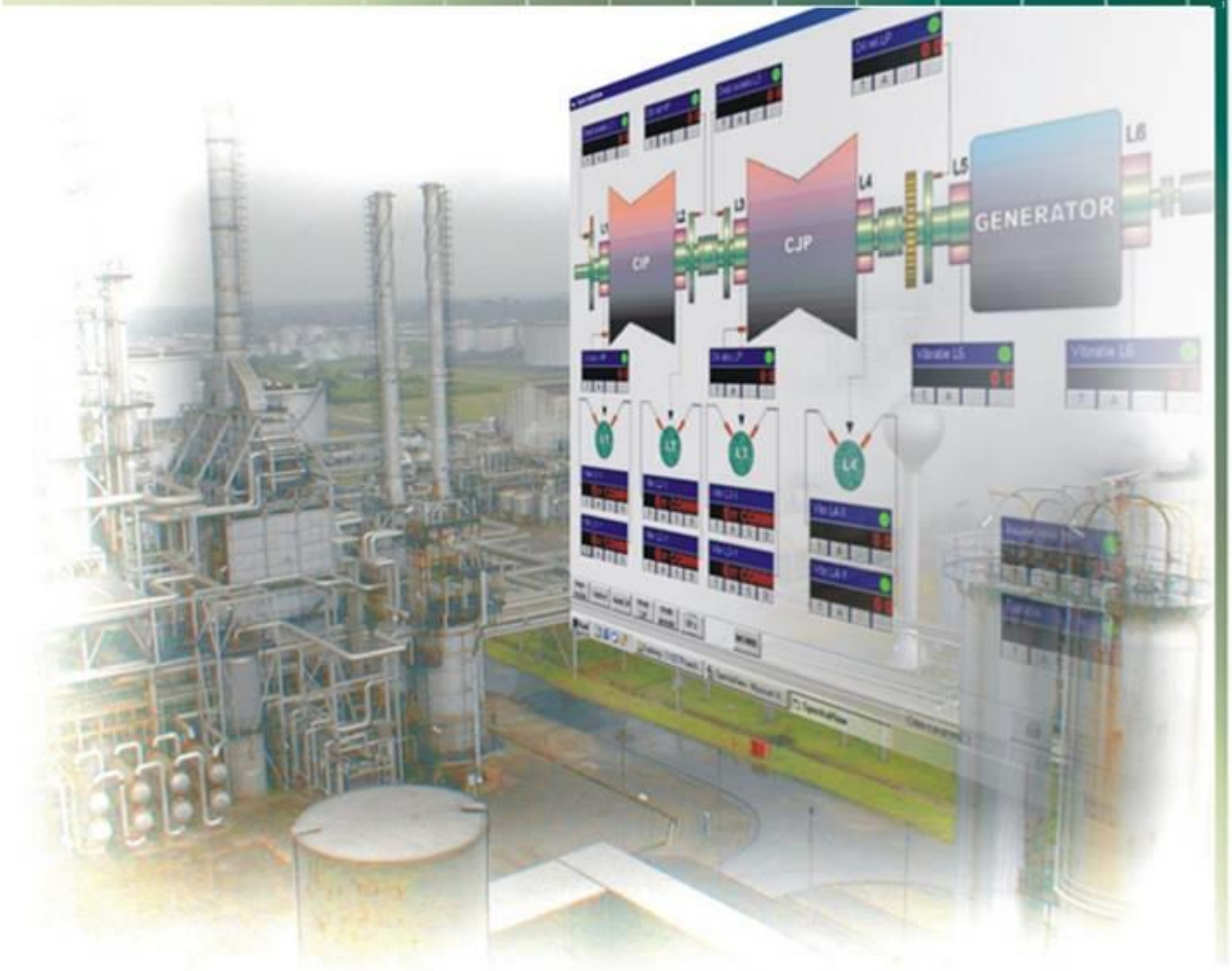


# CX300 MODULE

## USER MANUAL

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# CX300 MODULE

# User manual


**Document revision: REV. D**

**DOC. 2016002**

**June 2017**

Read the user manual carefully before starting to use the unit.

Producer reserves the right to implement changes without prior notice.

***Explanation of symbols used in the manual:***

| | |
|---|---|
|  | *This symbol denotes especially important guidelines concerning the installation and operation of the device. Not complying with the guidelines denoted by this symbol may cause an accident, damage or equipment destruction.* |
|  | *This symbol denotes especially important characteristics of the unit.*<br>*Read any information regarding this symbol carefully* |

IF THE DEVICE IS NOT USED ACCORDING TO THE MANUAL, THE USER IS RESPONSIBLE FOR POSSIBLE DAMAGES.

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# 1. BASIC REQUIREMENTS AND USER SAFETY

The manufacturer is not responsible for any damages caused by inappropriate installation, not maintaining the proper environmental conditions and using the unit contrary to its assignment.

Only qualified personnel should conduct installation. During installation, all available safety requirements should be considered. The fitter is responsible for executing the installation according to this manual, local safety and EMC regulations.

The unit must be properly set-up, according to the application. Incorrect configuration can cause defective operation, which can lead to unit damage or an accident.

If in the case of a unit malfunction, there is a risk of a serious threat to the safety of people or property additional, independent systems and solutions to prevent such a threat must be used.

Neighboring and connected equipment must meet the appropriate of appropriate standards and regulations concerning safety and be equipped with adequate overvoltage and interference filters.

Do not attempt to disassemble, repair, or modify the unit yourself. The unit has no user serviceable parts. Defective units must be disconnected and submitted for repairs at an authorized service center.

In order to minimize fire or electric shock hazard, the unit must be protected against atmospheric precipitation and excessive humidity.

Do not use the unit in areas threatened with excessive shocks, vibrations, dust, humidity, corrosive gasses, and oils.

Do not use the unit in areas where there is risk of explosions.

Do not use the unit in areas with significant temperature variations, exposure to condensation or ice.

Do not use the unit in areas exposed to direct sunlight.

Make sure that the ambient temperature (e.g. inside the control box) does not exceed the recommended values. In such cases, forced cooling of the unit must be considered (e.g. by using a ventilator).

***THE USE OF TOUCH-SCREEN***

Do not use pointers with sharp edges (like tips of pencils and pens, knifes, scissors, needles, wires, nails, screws, bolts etc.) while working with touch-screen. It is strongly recommended to use a special stylus made of plastic or another soft material with round ends. The display of the **CX300** should also be protected against aggressive substances and extremely high and low temperatures.

# 2. GENERAL CHARACTERISTICS

The **CX300** is a complete vibration & temperature monitoring and protection system in a single enclosure. The **CX300** is a sophisticated multichannel unit, which allows simultaneous measurement, visualization, and control of numerous channels. This device can operate autonomously or with cooperation with external PC software.

Essential features of **CX300** are listed and briefly described below.

- Compact multi-channel vibration and temperature data acquisition system;
- Four vibration input channels, suitable for ICP Accelerometers, velocity and displacement sensors;
- High frequency range and resolution, suitable for wide variation type of machines;
- Fast acquisition time, high sampling rate;
- 4 to 20 mA output for all vibration channels;
- Four temperature input channels for PT100 RTD (2 or 3-wires);
- One speed measurement channel;
- Bearing fault estimator(BE);
- Two galvanic isolate digital input;
- Protection system(CX300) with four software programmable output relay;
- Programmable alarm multiplier during start-up;
- Optional local LCD Display (3.5"TFT,320x240pixels,touch-screen navigation);
- Communication:1xUSBDevice,1xEthernet100Mb;
- Wide range for power supply (18to36Vdc);
- Low power consumption;
- IP65 protection.

# 3. TECHNICAL DATA

*Table 1*

| | |
|---|---|
| **Power supply voltage** | 18V to +36V DC (Typically +24 V ±10%) |
| Power consumption | 6 VA typical; 10 VA max. |
| External Fuse (required) | T -type, max. 2 A |
| **Vibration inputs** | Accelerometer, Velocity and Displacement Sensors |
| Channels | 4 |
| Max. frequency | 6400 Hz (configurable) |
| Amplitude range | 20 V p-p |
| Spectrum lines | Up to 6400 |
| Data acquisition | 12 channels simultaneous (three gains for each input, no auto-ranging required) |
| A/D resolution | 16 bits |
| Spectrum resolution | Selectable (0.5, 1 or 2 Hz) |
| Total value HPF | Selectable (none, 5 or 10 Hz) |
| Total value LPF | Selectable (from 200 to 6400 Hz) |
| Accelerometers supply | 4 mA @ 24 V dc |
| Bearing estimator | Bearing Energy Coefficient (BE) |
| BE HPF | 500 Hz |
| **Temperature inputs** | 4 X PT100 (2 or 3 wires) |
| Channels | 4 |
| Temperature range | Selectable (Min. -50ºC, Max 300 ºC) |
| **Speed input** | 1 |
| Speed range | 1 Hz to 5 KHz |
| **Digital inputs** | 2 (Start-up and Relay Reset), optocoupled |
| Power consumption | 7,5 mA / 24V, |
| Isolation | 500V DC |
| **Outputs** | |
| Analog | 4 X 4-20 mA (max. load 600Ω) |
| **Digital** | 4 relay |
| Max. load per relay | 5A, cos j = 1 (resistive load) |
| Max. voltage switched by relay | 250V AC |

| | |
|---|---|
| Isolation strength between relays | 1 min. @ 630V AC |
| **Communication interface** | |
| For measurements | 1 x Ethernet 100 MB (RJ-45) |
| For configuration | 1 x USB Device (for configuration and firmware upgrade) |
| **Protection** | IP 65 (with transparent door) |
| **Working temperature** | -10°C to +50°C |
| **Storage temperature** | -20°C to +70°C |
| **Humidity** | 5 to 90% no condensation |
| **Altitude** | Up to 2000 meters above sea level |
| **Enclosure** | Safety of Information Technology Equipment EN 60950<br>RoHS directive 2002/95/EC |
| Flammability Rating | Complies with UL 508 |
| UV resistance | Complies with UL 508 |
| Case style | DIN-Rail |
| Case material | Polycarbonate |
| Case dimensions (mm): | 213 x 185 x 120 |
| **Display** | (Optional) 3.5" graphic TFT, 16-bit color, 320 x 240 pixels, touchscreen navigation |
| **EMC** | PN-EN 61326-1 |
| **Safety requirements** | According to: PN-EN 61010-1<br>Installation category: II<br>Pollution degree: 2<br>Voltage in relation to ground: 300V AC<br>Isolation resistance: >20MΩ<br>Isolation strength between power supply and input/output terminal: 1min. @ 2300V |

***NOTE:***
*Analogic inputs are protected against overvoltage faults as large as ±45V.*

# 4. ORDER CODE

**CX300 – Module with touchscreen display**
**CX200 – Module without display**

| | |
|---|---|
| 200 | with 4×RTD, 4×4÷20 mA outputs and 4 relays |
| 300 | with 4×RTD, 4×4÷20 mA outputs and 4 relays |

# 5. TYPICAL APPLICATION

## 5.1. STAND-ALONE SIMPLE APPLICATION

A single unit can be used independently for a single machine.

After hardware and software configuration, the unit work independently.

If the unit is equipped with a local display, the measurement result and alarms status are available on the screen.

The unit still can be connected, via Ethernet, to a computer running *CX-MON300* application.

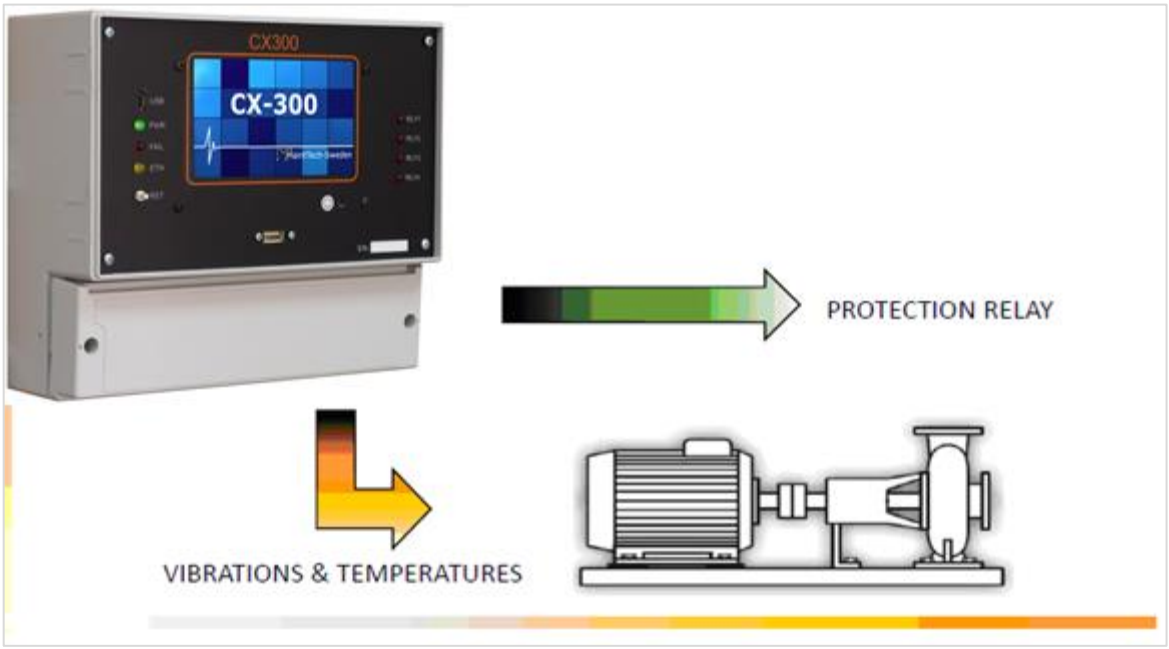



*Figure 1 - Stand-alone typically application*

## 5.2. NETWORK APPLICATION

In this configuration, up to 10 units can be connected to a local network and to a computer, when running *CX-MON300* application.

Each unit must have an independent IP Address.

See Addendum A to find more regarding IP allocation.

The *CX-MON300* application acts as a network server. The measurements result and alarms can be visualized in a series of computers running *CX-MON300Client* application.

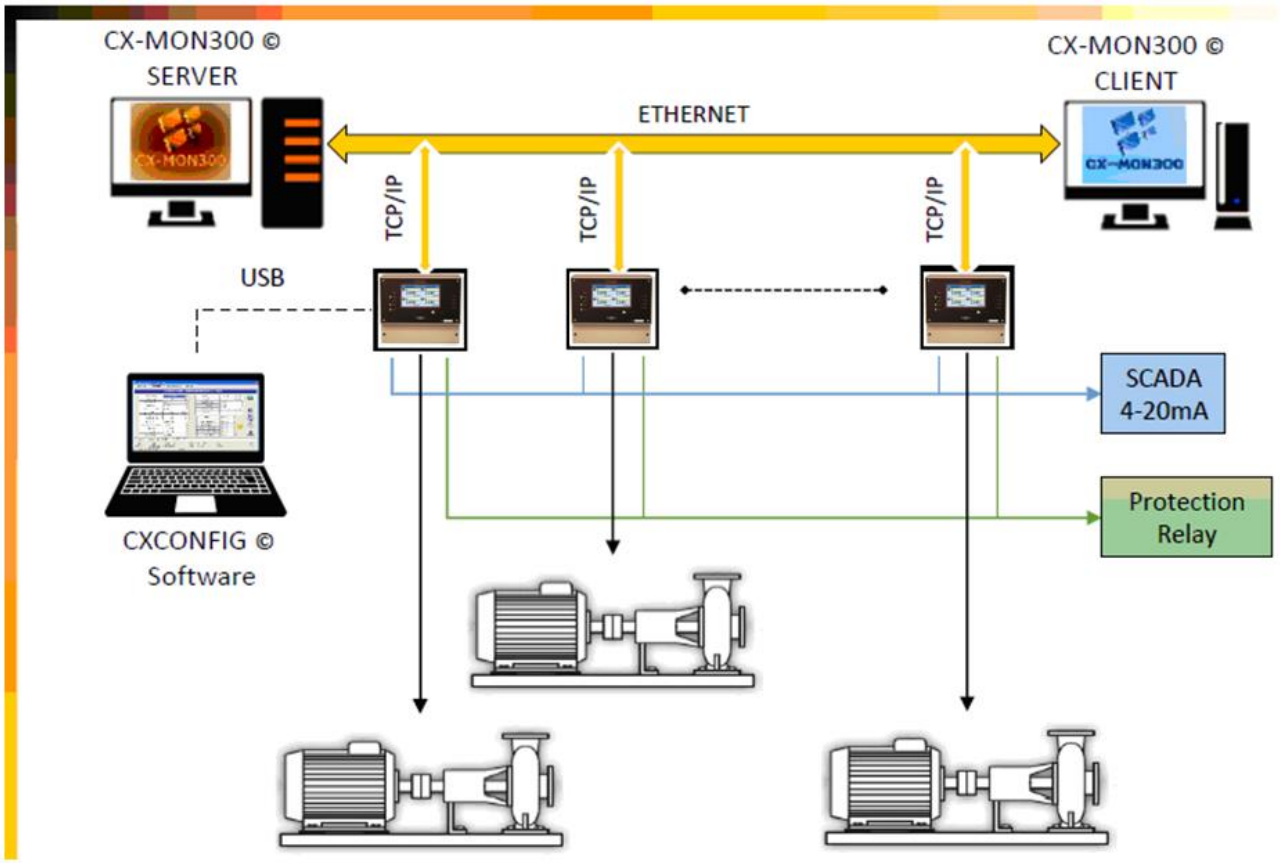



*Figure 2 - Network typically application*

## 5.3. CX-MON300 Monitoring Software

There are two free software applications delivered with any CX300 unit:

- *CX-MON300*
- *CX-MON300Client*

*CX-MON300* Software is able to manage the measurements from up to 10 **CX300** units. The software is similar with a SCADA system and can be configured by the user.

*Scheduled*, *On Alarm* or *On demand* the measurements (including spectra) can be transferred to any *CXSpectra*© database.

For more details, see *CX-MON300 User Manual.*

*CX-MON300Client* is simple software being a *client* for the *CX-MON300.*

Many client installations are allowed.

This software is almost identically with the *server* application, but cannot visualize spectra and time signals.

For more details, see *CX-MON300Client User Manual.*

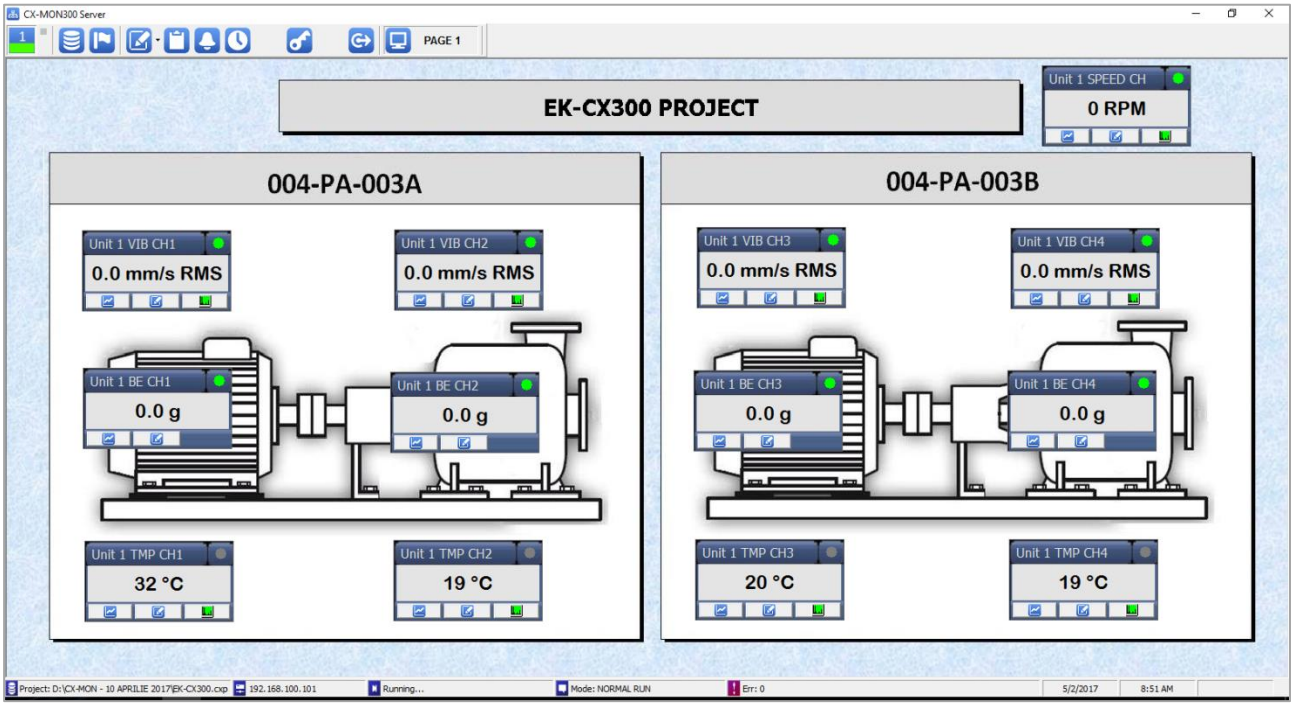



*Figure 3 - Showing the measurements in CX-MON300 software*

## 6. DEVICE INSTALLATION

The unit has been designed and manufactured in a way assuring a high level of user safety and resistance to interference occurring in a typical industrial environment. In order to take full advantage of these characteristics installation of the unit must be conducted correctly and according to the local regulations.

| | |
|---|---|
| ⓘ | Read the basic safety requirements prior to starting the installation.<br>Ensure that the power supply voltage corresponds to the nominal voltage (18 to 36 V DC).<br>**ALL INSTALLATION WORKS MUST BE CONDUCTED WITH A DISCONNECTED POWER SUPPLY!!!**<br>Protecting the power supply connections against unauthorized persons must be taken into consideration. |

## 6.1. UNPACKING

After removing the unit from the protective packaging, check for transportation damage.

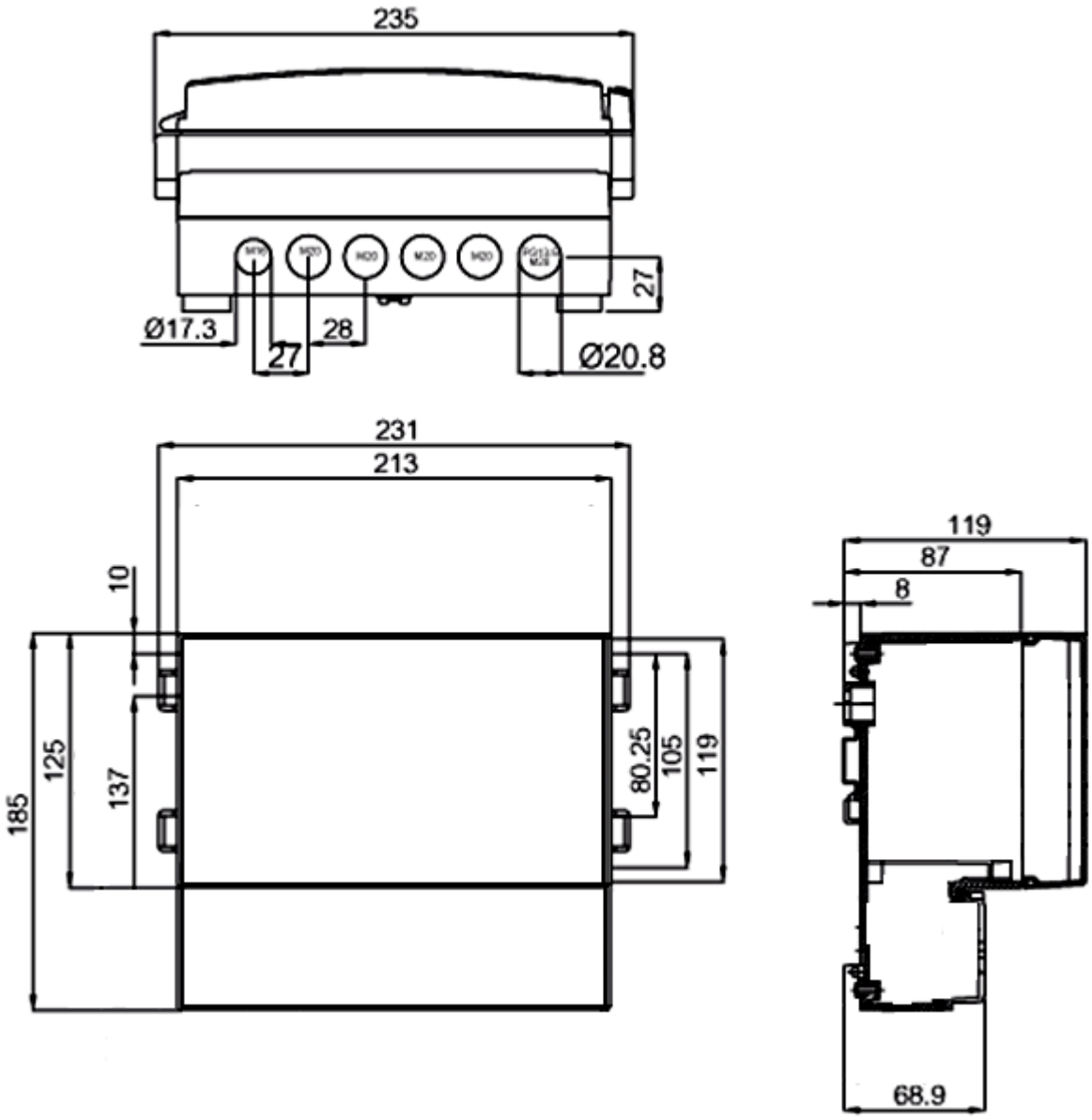



*Figure 4 - CX300 enclosure dimensions (in mm)*

Any transportation damage must be immediately reported to the carrier. Also, write down the unit serial number located on the housing and report the damage to the manufacturer.

## 6.2. ASSEMBLY

The unit is designed for mounting inside housings (control panel, switchboard) insuring appropriate protection against surges and interference. Metal housings must be connected to ground in a way that complies with the governing regulations.

**DISCONNECT THE POWER SUPPLY PRIOR TO STARTING ASSEMBLY.**

Check the connections are wired correctly, prior to switching the unit on.

***Caution***

Installation should be conducted by qualified personnel. During installation, all available safety requirements should be considered. The fitter is responsible for executing the installation according to this manual, local safety and EMC regulations.

The unit is not equipped with an internal fuse or power supply circuit breaker.

Because of this, an external time-delay cutout fuse with a small nominal current value must be used (recommended bipolar, max. 2A).

The diameter of power supply network cable must be selected somehow that in the case of a short circuit of the cable from the side of the unit, the cable shall be protected against destruction with an electrical installation fuse.

Wiring must meet the appropriate standards and local regulations and laws.

In order to secure against accidental short circuit, the connection cables must be terminated with the appropriate insulated cable tips.

Tighten the clamping screws. The recommended tightening torque is 0.5 Nm.

Loose screws can cause fire or defective operation. Over tightening can lead to damaging the connections inside the units and breaking the thread.

**Unused terminals must not be used for connecting any connecting cables (e.g. as bridges), because this can cause damage to the equipment or electric shock.**

When the installation is completed, do not touch the unit's connections when it is switched on, because it carries the risk of electrical shock.

Due to possible significant interference in industrial installations, appropriate measures assuring correct operation of the unit must be applied. To avoid the unit of improper indications keep recommendations listed below.

Avoid running signal cables and transmission cables together with power supply cables and cables controlling inductive loads (e.g. contactors). Such cables should cross at a right angle.

- Contactor coils and inductive loads should be equipped with interference protection systems, e.g. RC-type.
- Use of screened signal cables is recommended. Signal cable screens should be connected to the earth only at one of the ends of the screened cable.
- In the case of magnetically induced interference, the use of twisted pair signal cables is recommended. Twisted pair (best if shielded) must be used with 4 to 20 mA analogical outputs.

- In the case of measurement or control, signals are longer than 30m or go outside of the building then additional safety circuits are required.
- In the case of interference from the power supply side, the use of appropriate interference filters is recommended. Bear in mind that the connection between the filter and the unit should be as short as possible and the metal housing of the filter must be connected to the earth with the largest possible surface. The cables connected to the filter output must not be run with cables with interference (e.g. circuits controlling relays or contactors).

Connections of power supply voltage and measurement signals are executed using the screw connections of the unit's enclosure.

## 6.3. CONNECTION TERMINALS

Each terminal is labeled with a number.

The actual meaning of each terminal is labeled inside on the terminals cover.

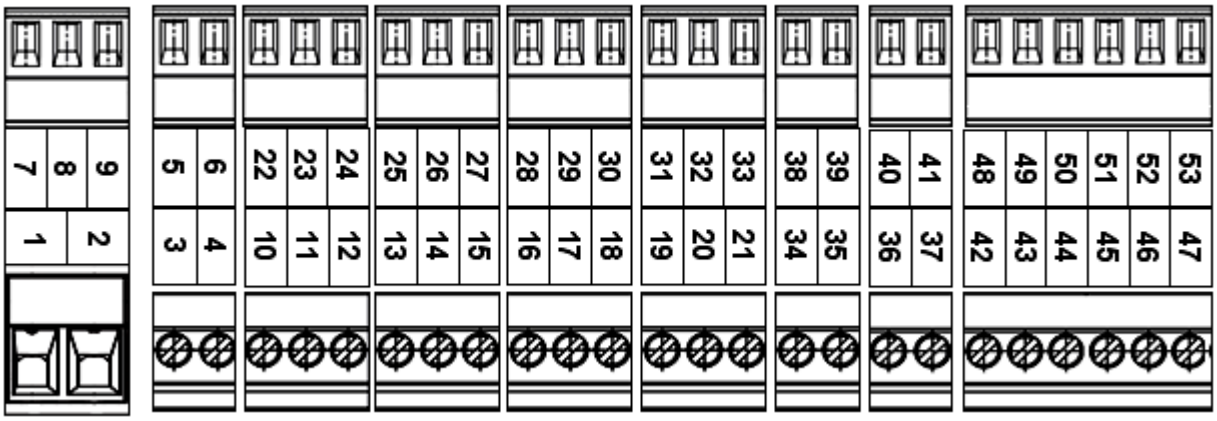



*Figure 5 - Connection terminals*

The table below shows the standard terminal assignment of the **CX300** unit.

*Table 2 - Terminal assignment*

| Terminal label | Description |
|---|---|
| 1 | Power supply - Positive side<br>Typically 24 V dc (18 to 36 V dc) |
| 2 | Power supply - Negative side |
| 3 | DI1 - Digital input (IN) - See Note 1 |
| 4 | DI1 - Digital input (GND) |
| 5 | DI2 - Digital input (IN) - See Note 1 |
| 6 | DI2 - Digital input (GND) |
| 7 | Speed CH1 (IN) |
| 8 | Speed CH1 (COM) |
| 9 | Speed CH1 power supply (12 or 24 V dc) - See Note 2 |
| 10 | VIB CH1 - IN |
| 11 | VIB CH1 - COM |
| 12 | VIB CH1 - SCREEN - See Note 3 |
| 13 | VIB CH2 - IN |
| 14 | VIB CH2 - COM |
| 15 | VIB CH2 - SCREEN - See Note 3 |

| | |
|---|---|
| 16 | VIB CH3 - IN |
| 17 | VIB CH3 - COM |
| 18 | VIB CH3 - SCREEN - See Note 3 |
| 19 | VIB CH4 - IN |
| 20 | VIB CH4 - COM |
| 21 | VIB CH4 - SCREEN - See Note 3 |
| 22 | RTD CH1 - A |
| 23 | RTD CH1 - B |
| 24 | RTD CH1 - b - See Note 4 |
| 25 | RTD CH2 - A |
| 26 | RTD CH2 - B |
| 27 | RTD CH2 - b - See Note 4 |
| 28 | RTD CH3 - A |
| 29 | RTD CH3 - B |
| 30 | RTD CH3 - b - See Note 4 |
| 31 | RTD CH4 - A |
| 32 | RTD CH4 - B |
| 33 | RTD CH4 - b - See Note 4 |
| 34 | OUT1 (mA) - positive |
| 35 | OUT1 (mA) - negative - See Note 5 |
| 36 | OUT2 (mA) - positive |
| 37 | OUT2 (mA) - negative - See Note 5 |
| 38 | OUT3 (mA) - positive |
| 39 | OUT3 (mA) - negative - See Note 5 |
| 40 | OUT4 (mA) - positive |
| 41 | OUT4 (mA) - negative - See Note 5 |
| 42 | RL1 - CC (Relay contact) |
| 43 | RL1 – NC (Relay contact) |
| 44 | RL1 – NO (Relay contact) |
| 45 | RL2 - CC (Relay contact) |
| 46 | RL2 – NC (Relay contact) |
| 47 | RL2 – NO (Relay contact) |
| 48 | RL3 - CC (Relay contact) |
| 49 | RL3 – NC (Relay contact) |
| 50 | RL3 – NO (Relay contact) |
| 51 | RL4 - CC (Relay contact) |
| 52 | RL4 – NC (Relay contact) |
| 53 | RL4 – NO (Relay contact) |
| 54 | LCD power supply + (Not accessible for the user) |
| 55 | LCD power supply - (Not accessible for the user) |
| 56 | LCD TX (Not accessible for the user) |
| 57 | LCD COM (Not accessible for the user) |
| 58 | LCD RX (Not accessible for the user) |
| 59 | Fan power supply (+24V) - See Note 6 |
| 60 | Fan power supply (-24V) |

***NOTE 1:*** Logical "1" - short between IN and GND

Logical"0" - leave open

Do not apply any external voltage on these inputs!

A free relay contact or push-button must be used to activate the digital input.

***NOTE 2:*** External speed sensor can be supplied at 12 or 24 V dc (max 100mA). The unit cover must be removed, to have access to a jumper. The jumper position must be changed (for detail see Chapter 7).

***NOTE 3:*** These terminals are internally connected to the negative side of the power supply (24 V dc). Because the power supply negative side is normally connected to an earth (shield) point, these terminal can be also be considered a ground terminals. Signal cable screens should be connected to the earth only at one of the ends of the screened cable. Leave unconnected if the vibration screen is connected to the earth in another place.

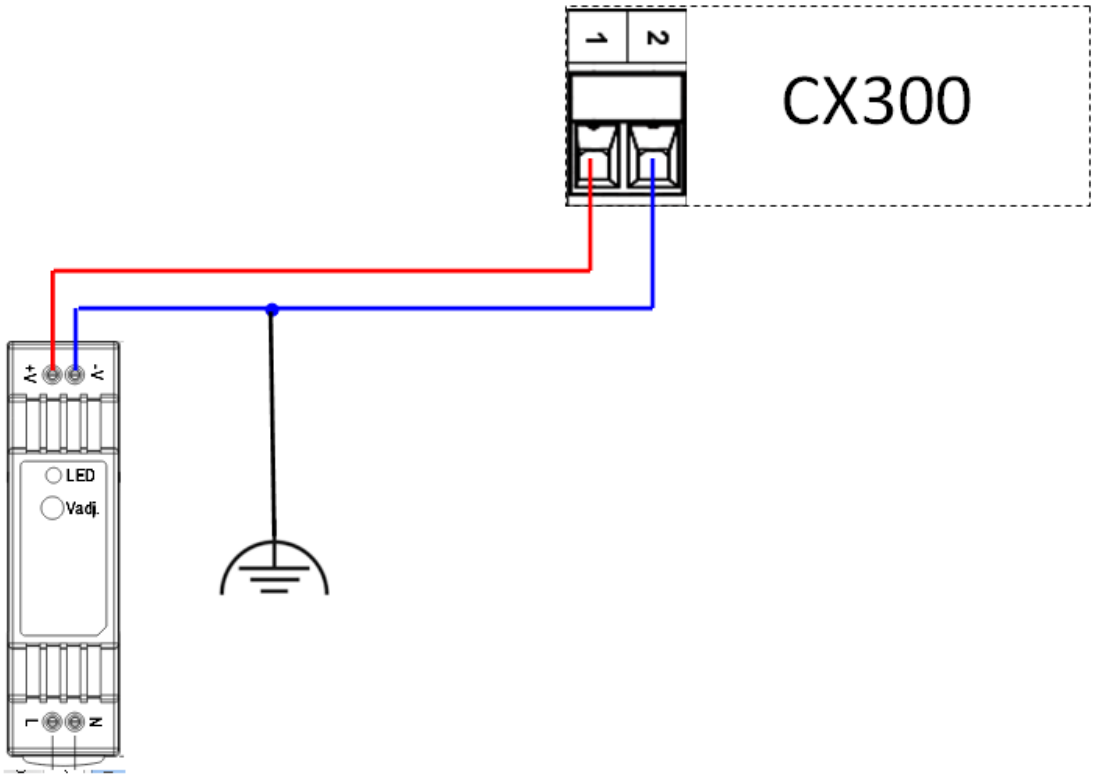



*Figure 6 - Typical external power supply wiring diagram.*

***NOTE 4***: These inputs are used for temperature measurement using RTD type temperature sensors (by 2- and 3-wire method). Only RTD's type PT100 can be used. In 2-wire method, connect terminal "B" with "b."

***NOTE 5***: These outputs have a common minus (-) terminal. Therefore, the terminals 35, 37, 39 and 41 are connected together.

***NOTE 6***: The power supply for an additional cooling fan is the unit main power (Terminals 1 and 2). A thermal switch placed inside of the unit supplies the external fan when the inside temperature increases more than 60ºC.

The unit cover must be removed to have access to these terminals.

# 7. HARDWARE CONFIGURATION

Before to use the unit, this must be hardware configured, to meet the requirements of your application.

Two hardware configurations are available:

- Power to accelerometer (Enable/Disable)
- Set the voltage for the speed sensor supply.

The unit cover must be removed to ensure the access to the baseboard!

Changed should be conducted by qualified personnel.

## 7.1. ACCELEROMETER POWER

If standard accelerometers are used, these need a constant current power supply of 4 mA@24Vdc.

A mini - switch with four positions is placed on the baseboard.

Change the position of the switches according to the next table:

*Table 3*

| Switch No. | ON position | OFF position |
|---|---|---|
| 1 | Supply enabled | Supply disabled |
| 2 | Supply enabled | Supply disabled |
| 3 | Supply enabled | Supply disabled |
| 4 | Supply enabled | Supply disabled |

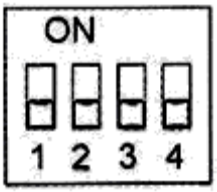
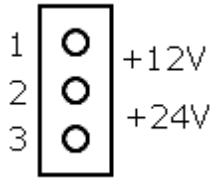



*Figure 7 - Power to accelerometers switches*

Factory default for all switches is *ON*.

## 7.2. VOLTAGE FOR SPEED SENSOR




Place the jumper onto position 1-2 for +12V dc power supply.

Place the jumper onto position 2-3 for +24V dc power supply.

If power is not required, remove the jumper.

*Figure 8 - Power to accelerometers switches*

# 8. SOFTWARE CONFIGURATION

Each unit can be configured to meet the demands of customer application.

Software configuration will be done with an external PC application: *CX300Config*.

For more details, please read the *CX300Config User Manual*.

## 8.1. GENERAL UNIT CONFIGURATION

*Table 4*

| Configuration | Description |
|---|---|
| Module Type | [READ-ONLY] Module type can be CX200 or CX300<br>Module code CX300 has a local LCD display, placed onto the front panel.<br>Module coded CX200 doesn't have a display. |
| Module Name | Module name can be any text with max.17 letters.<br>Longer names will be truncated.<br>This is the 'friendly' module name. |
| Board Version | [READ-ONLY] This is a number to identify the module firmware version and the specific hardware installed. |
| Serial Number | [READ-ONLY] This is the Module Serial Number |
| IP Address | This is the Module TCP/ IP Address |
| Max. Freq. Range | This can be set to 3200 Hz or to 6400 Hz.<br>Will be the same for all vibration channels |
| Resolution | [READ ONLY] - Spectrum resolution - is the same for all vibration channels! |
| Relay settings | Relay can be set to be 'Fail-safe' - energized if is no alarm condition exists, or 'Normal' - energized on alarm |
| Start-up multiplier | Alarms multiplier factor during start-up<br>Only for vibration and BE measurements.<br>Can be set from a list (X 1.5 up to X 10.0) |
| Start-up time | Start-up time [1 to 255 seconds]<br>The alarm multiplier is acting only in this time interval, after the starting-up. |

## 8.2. VIBRATION AND BE MEASUREMENTS

*Table 5*

| Configuration | Description |
|---|---|
| Transducer type | Transducer type to be connected (or set to NOT USED)<br>Selected from a list: Accelerometer, Velocity or Displacement |
| Sensitivity | Transducer sensitivity in 'mV/g', 'mV/mm/sec' or 'mV/um' |
| Show Unit | Show unit for this vibration measurement<br>Selection of: $mm/s^2$, g, mm/sec, m/sec, in/sec, µm, mm, inch |
| Show Detection | RMS, Peak or P-P |
| Scale | Scale (in Show units) for this vibration measurement channel - This will be also the scale for mA Output, if is *enabled.* |
| Transducer LO | Transducer lower bias voltage allowed. Min -24V<br>Used to check transducer integrity |
| Transducer HI | Transducer higher bias voltage allowed. Max.+24V |

| | |
|---|---|
| Spectrum LPF | Spectrum frequency range (in Hz)<br>Selected from a list: 200 Hz to 6400 Hz<br>Value cannot be more than *Max. Freq. Range* (See Table 4) |
| Use measured speed | Enabled or disabled. If this is enabled, the speed value will be transferred in *CXSpectra©* database, together with the total value, BE and spectrum |
| Total HPF | High Pass Filter for Total Value calculation (in Hz)<br>Selected from a list: (none), 5 Hz or 10 Hz |
| Total LPF | Low Pass Filter for Total Value calculation (in Hz)<br>Selected from a list: 200 Hz to 6400 Hz<br>This vale cannot be greater than *SpectrumLPF* |
| Alarm vibration | Enabled or disabled. Trigger measurement alarm condition. |
| Warning Vib | Warning level for vibration (in Show Unit) |
| Danger Vib | Danger level for vibration (in Show Unit) |
| Measure BE | Enable/Disable BE measurement for this channel |
| Alarm BE | Enabled or disabled. Trigger measurement alarm condition. |
| Warning BE | Warning level for BE (in "gBE") |
| Danger BE | Danger level for BE (in "gBE") |
| Delay RLY | Delay in Relay action (seconds)<br>Selected from a list: 1 to 10 seconds |

| | |
|---|---|
| Map Warning Vib | Map vibration Warning Alarm to a specific Relay<br>Selected from a list: (none), RLY1, RLY2, RLY3 or RLY4 |
| Map Danger Vib | Map vibration Danger Alarm to a specific Relay<br>Selected from a list: (none), RLY1, RLY2, RLY3 or RLY4 |
| Map Warning BE | Map BE Warning Alarm to a specific Relay<br>Selected from a list: (none), RLY1, RLY2, RLY3 or RLY4 |
| Map Danger BE | Map BE Danger Alarm to a specific Relay<br>Selected from a list: (none), RLY1, RLY2, RLY3 or RLY4 |
| mA Output | Enable/Disable current output (4 to 20 mA) for this measurement |

## 8.3. TEMPERATURE MEASUREMENTS

*Table 6*

| Configuration | Description |
|---|---|
| Show Unit | Temperature show unit, either ºC or ºF (or set to NOT CONNECTED) |
| Scale LO | Scale LO value, from selection: -50, -25, 0 (in *Show Unit*) |
| Scale HI | Scale HI value, from selection: 100, 125, 150, 200 or 300 (in *Show Unit*) |
| Alarm temperature | Enable/Disable temperature alarms.<br>Trigger measurement alarm condition. |
| Warning Temperature | Warning level for temperature (in *Show Unit*) |
| Danger Temperature | Danger level for temperature (in *Show Unit*) |
| Map Warning Temp | Map temperature Warning Alarm to a specific Relay<br>Selected from a list: (none), RLY1, RLY2, RLY3 or RLY4 |
| Map Danger Temp | Map temperature Danger Alarm to a specific Relay<br>Selected from a list: (none), RLY1, RLY2, RLY3 or RLY4 |

## 8.4. SPEED MEASUREMENT

*Table 7*

| Configuration | Description |
|---|---|
| Show Unit | Speed show unit. Can be: RPM or Hz |
| Scale | Scale value, from selection: 200 to 20000 (in *Show Unit*) |
| Alarm speed | Enable/Disable alarm.<br>Trigger measurement alarm condition. |
| Warning Speed | Warning level for speed (in *Show Unit*) |
| Danger Speed | Danger level for speed (in *Show Unit*) |
| Map Warning Speed | Map speed Warning Alarm to a specific Relay<br>Selected from a list: (none), RLY1, RLY2, RLY3 or RLY4 |
| Map Danger Speed | Map speed Danger Alarm to a specific Relay<br>Selected from a list: (none), RLY1, RLY2, RLY3 or RLY4 |

Before doing any change, just make sure that the machine is not running!

The manufacturer is not responsible for any damages caused by improper settings. Modification should be conducted by qualified personnel. During setting modification, all the available safety requirements should be considered.

***NOTE:*** The four current outputs (4 to 20 mA) are available only for Total Vibration value. By request, additional four current outputs can be equipped for *Temperature* measurements, but two relays (RLY3 and RLY4) will be removed (only RLY1 and RLY2 will be available).

In the above configuration, a part of the terminals table (Table 2) must be changed as shown below (Table 8):

*Table 8 -Modified terminals assignment*

| Terminal label | Description |
|---|---|
| 48 | OUT5 (mA) - positive |
| 49 | OUT5/6 COM - negative |
| 50 | OUT6 (mA) - positive |
| 51 | OUT7 (mA) - positive |
| 52 | OUT7/8 COM - negative |
| 53 | OUT8 (mA) - positive |

# 9. NORMAL STARTING SEQUENCE

*Table 9 – LED's status on startup*

| LED | ~ 1sec | >1 sec |
|---|---|---|
| Green | ON | ON |
| Red | ON | OFF |
| Yellow | ON | BLINK (See Note below) |

***NOTE:***

1. If CX-MON300 application is already started, the yellow LED will blink fast (90% ON and 10% OFF for a period of 1 second)
2. If CX-MON300 application doesn't run, the yellow LED will blink symmetrically and fast (50% ON and 50% OFF, for a period of 1 second)
3. If CX300 Module didn't succeed to connect itself to the Ethernet Network, the Yellow LED will blink symmetrically slow (50% ON and 50% OFF, for a period of ~ 2 seconds). Check the network integrity and RESET the module.

# 10. CX300 LED INDICATOR

**Green LED**

- ON – Indicate that the main processor running OK
- OFF – Indicate a +5V power supply failure or the main processor is defective

**Red LED**

- OFF – This is the normal status after the starting sequence
- ON – Vibration cannot be acquired (defective A/D converters or a fault onto the Vibration Board)
- BLINK – A malfunction of the Output Board (Temperature, current output or Relays).

**Yellow LED**

- BLINK FAST symmetrically; Ethernet network is OK. CX300 awaiting connection;
- BLINK FAST (80% ON and 10% OFF). A client (CX-MON300) is connected and communicates with the module;
- BLINK SLOW symmetrically. CX300 cannot make a connection to the existing Ethernet Network. Try to RESET the module.

# 11. TROUBLESHOOTING

*Table 10 – Troubleshooting solution*

| Symptom | Possible cause | Solution |
|---|---|---|
| A CX300 module cannot be connected to CX-MON300 software. | • Wrong IP Address<br>• Module IP Address is unchecked in CX-MON300 software<br>• Hardware network connection | ✓Check the IP Address for both CX300 module and software.<br>✓Check module status in the communication list.<br>✓Check cables, switches, or router.<br>***NOTE:*** *The module must be connected to the network BEFORE being switched-on.*<br>✓Try a module reset (this action won't change relay's position).<br>✓Switch again off and on the module, (this action may change temporary relay's position!) |
| Touchscreen is irresponsive and seems to be "*frozen*". | • Unknown | ✓Press the ON/ OFF button continuously, for about 10 sec. The display will be shut-off. Press again the same button to start the display. This action won't change relay's position. |
| A vibration channel shows "Transducer failure". | • Wrong "Transducer LO" or "Transducer HI" settings<br>• Defective transducer | ✓Readjust the setting parameters (use CX300Config).<br>✓Replace transducer. |
| A temperature channel shows "Transducer failure". | • Short-circuit of RTD wires or interrupted cable;<br>• Defective RTD transducer | ✓Check cable connection.<br>✓Check RTD sensor.<br>✓Replace temperature sensor. |
| A new setting is not reflected in CX300 module. | • Changes are done only if CX300 is hardware reset. | ✓Reset the module. |

# 12. MAINTENANCE

The unit does not have any internal replaceable or adjustable components available to the user. Pay attention to the ambient temperature in the room where the unit is operating.

Excessively high temperatures cause faster ageing of the internal components and shorten the fault-free time of the unit's operation.

When the unit gets dirt, do not clean with solvents. For cleaning, just use warm water with a small amount of detergent or in the case of more significant contamination ethyl or isopropyl alcohol.

# ADDENDUM A

## *Assigning Private Network IP Addresses to the CX300 Modules*

Since not all CX300 modules have official Internet assigned addressees, there must be a specific and accepted way to allocate addresses to those modules, without conflicting with anyone else's Internet address.

RFC 1918 is the official document on which IP addresses are to be used in a non-connected or "private" network. There are 3 blocks of numbers set aside specifically for this purpose.

Section 3: Private Address Space

The Internet Assigned Numbers Authority (IANA) has reserved the

following three blocks of the IP address space for private networks:

10.0.0.0 - 10.255.255.255

172.16.0.0 - 172.31.255.255

192.168.0.0 - 192.168.255.255

We will refer to the first block as "24-bit block", the second as "20-bit block", and the third as "16-bit" block". Note that the first block is nothing but a single class A network number, while the second block is a set of 16 continuous class B network numbers, and the third block is a set of 255 continuous class C network numbers.

For CX300 Modules use the 192.168.0.0 network with a 255.255.255.0 Class-C subnet mask. Any of the above private networks are valid, but just be SURE to use the correct subnet-mask.

So, if you're using a Class-C network, you should number your TCP/IP enabled Modules as 192.168.1.2, 192.168.3, 192.168.1.4..., 192.168.1.255 and the PC running CX300-MON must have any IP below these (Ex. 192.168.1.1 with 255.255.255.0 subnet-mask).

## Documentation Feedback

*Any suggestions and comments for improving this Application Notes should be e-mailed at* *mainttech@live.se*

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## Technical Support

### *Contact Details*

For any problem regarding this application, feel free to contact our support team at mobind@mobilindustrial.ro

To know more about us, visit the following website: http://www.mobilindustrial.ro/