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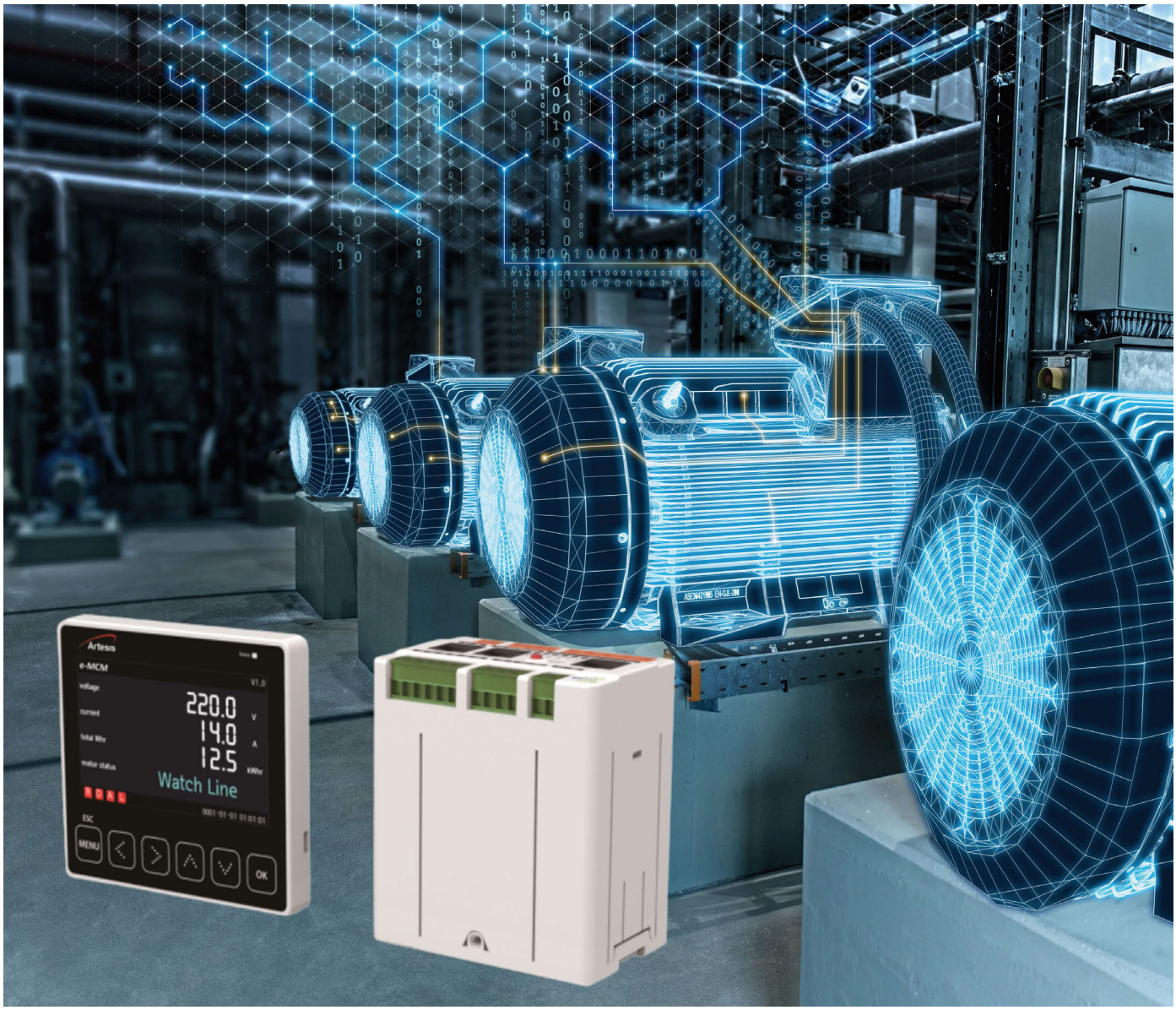
Artesis Condition Monitoring Systems

Predictive manintenance and Energy Efficieny Solutions



Artesis

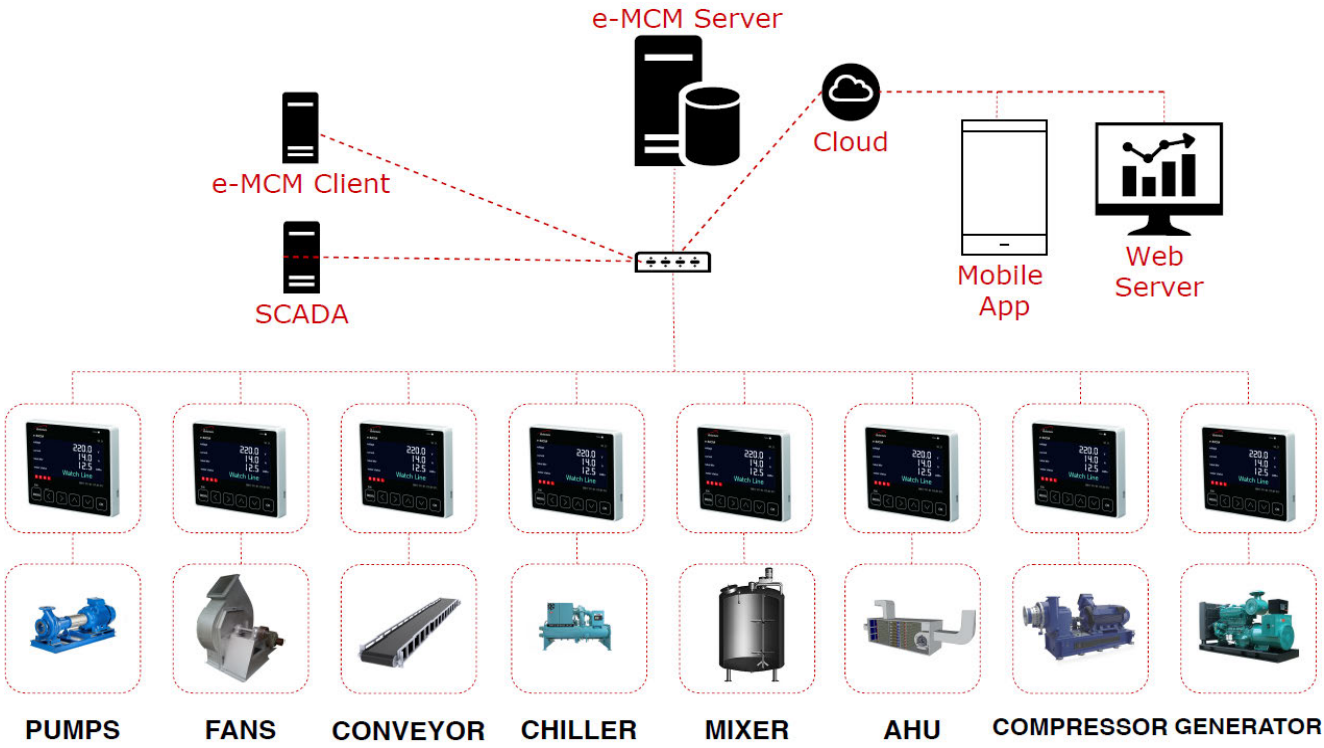
Simplifies Predictive Maintenance

e-MCM is a powerful online condition monitoring, predictive maintenance and power meter tool intended for critical AC rotating equipment. The patented machine learning algorithm of e-MCM enables comprehensive fault detection up to 6 months in advance. This allows the Artesis system to provide concise information answering the following key questions:

What's wrong?

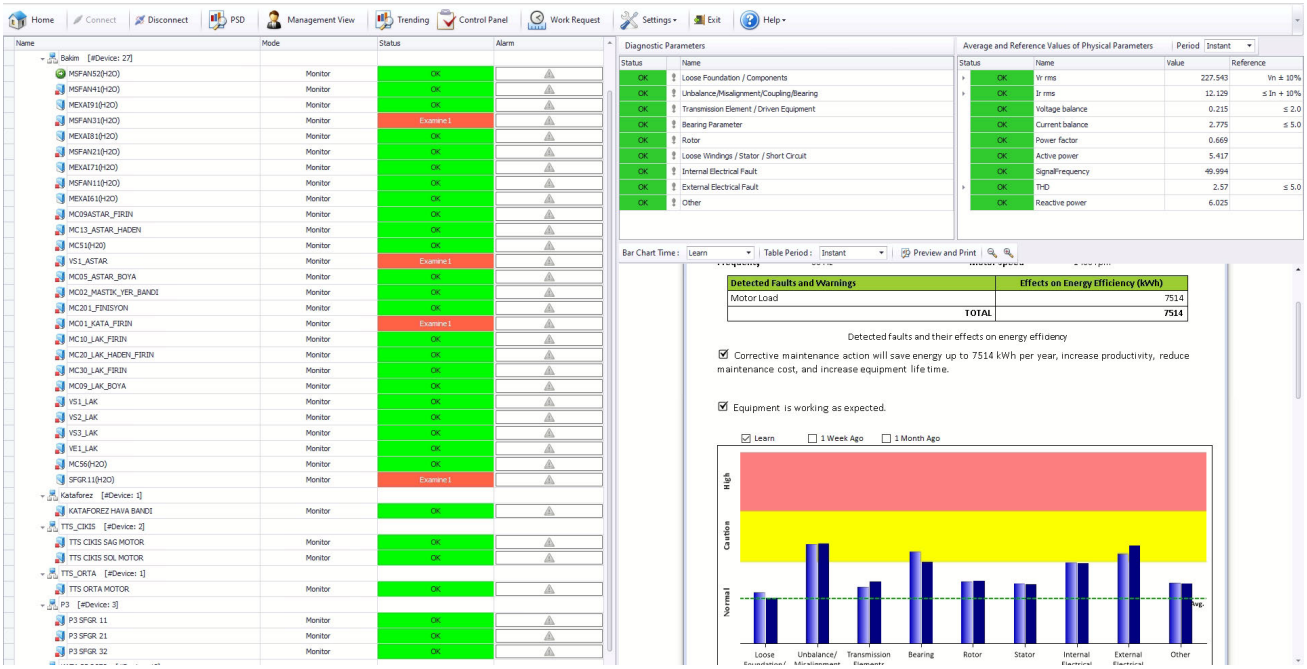
What do I have to do?

How soon do I have to do it?

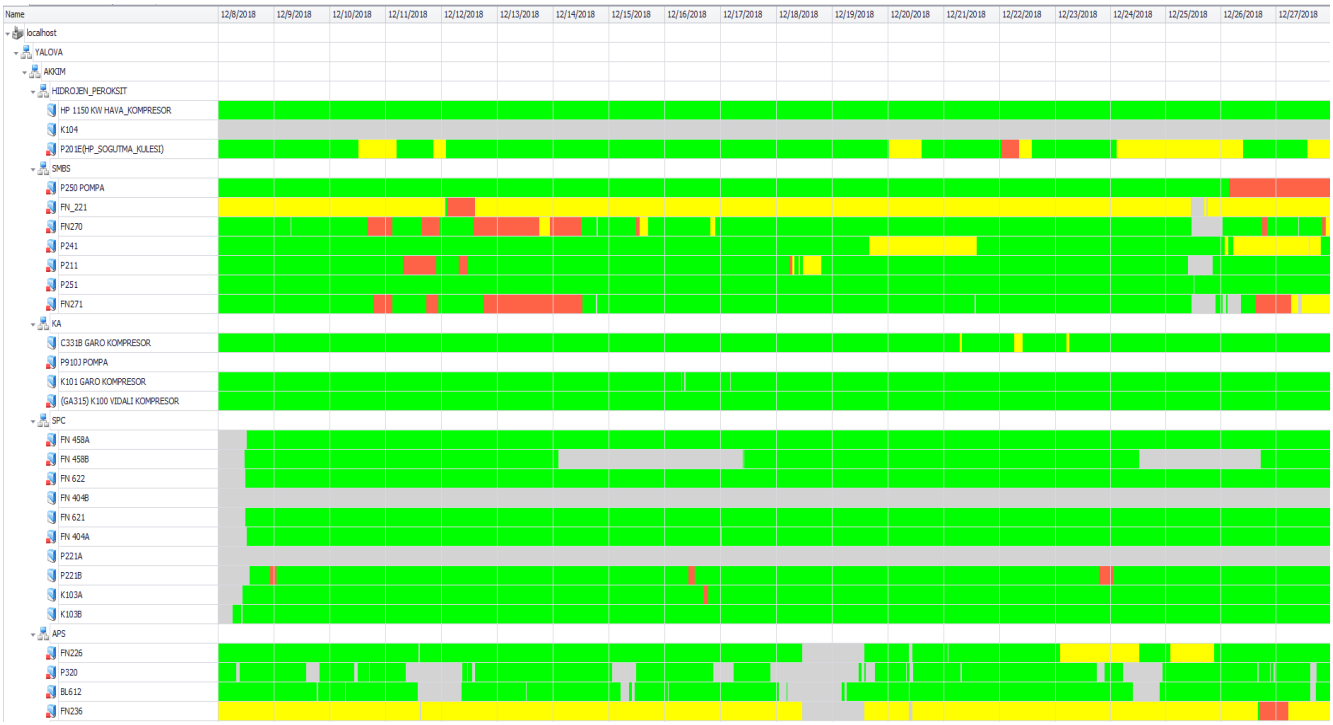


- Simple interface providing actionable information via automated fault diagnosis capability
- Compherensive fault coverage by monitoring electrical,mechanical and process conditions of rotating equipment
- On remote or inaccessible equipment which is difficult to monitor with other technologies
- In hazardous or extreme environments where sensors cannot be mounted to the equipment
- Integration packages are available to a wide range of 3rd party systems, including Integrated Condition Monitoring, SCADA/HMI, and Reporting/Business Intelligence

Windows Client Software

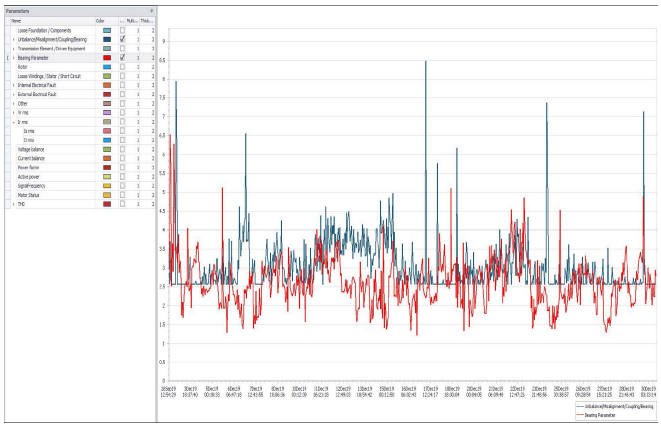


Management View



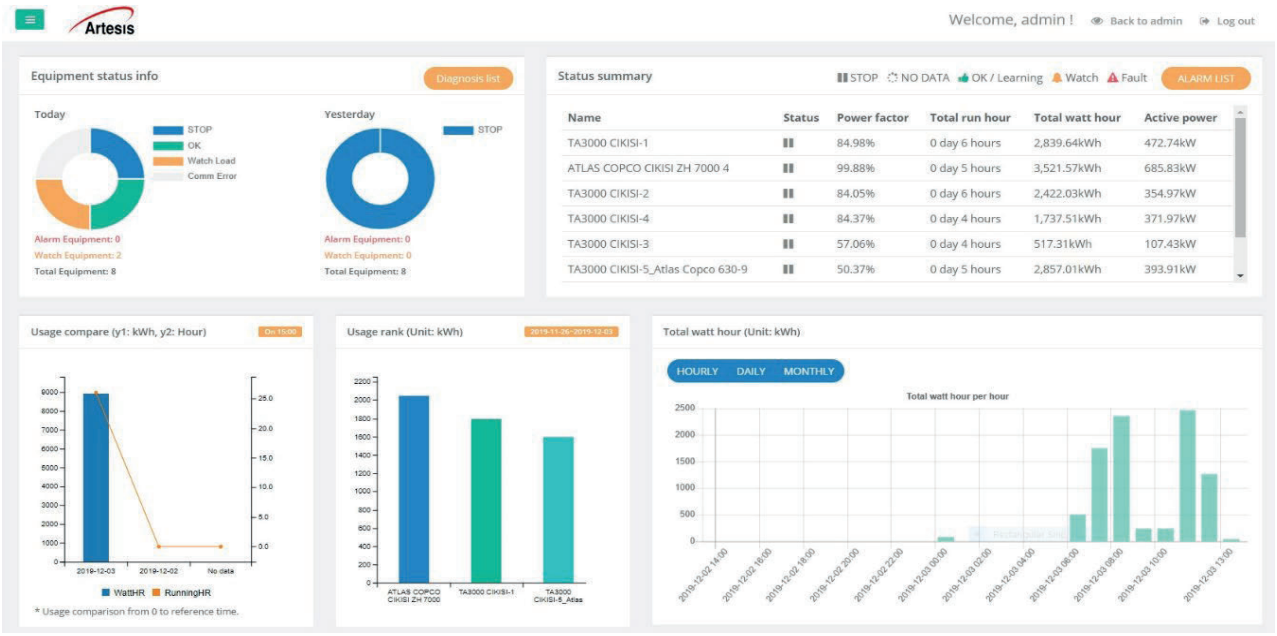
PSD analysis screen

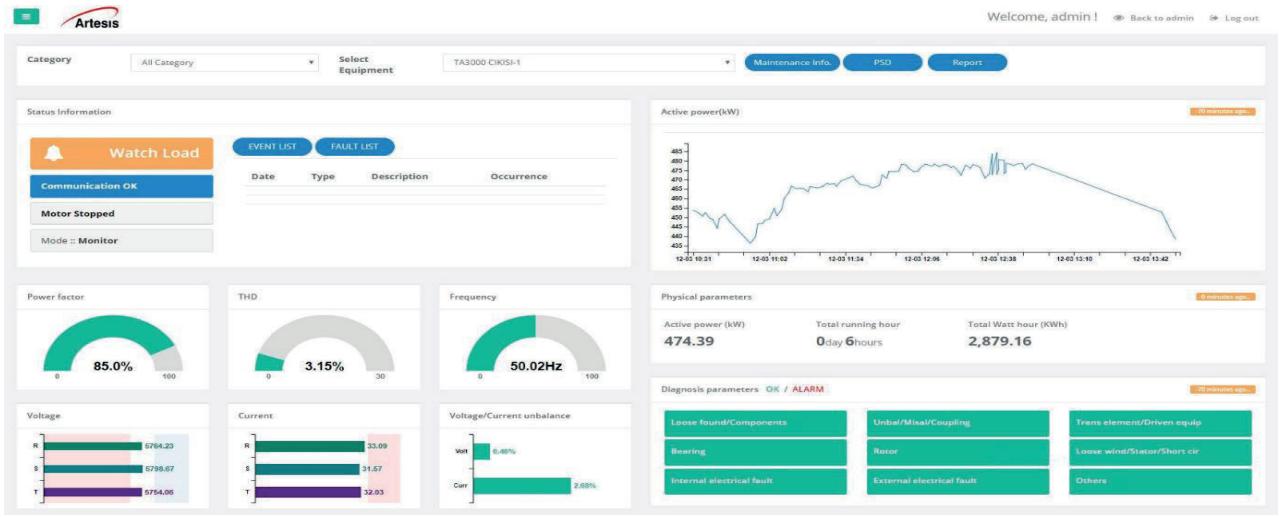
Trend screen

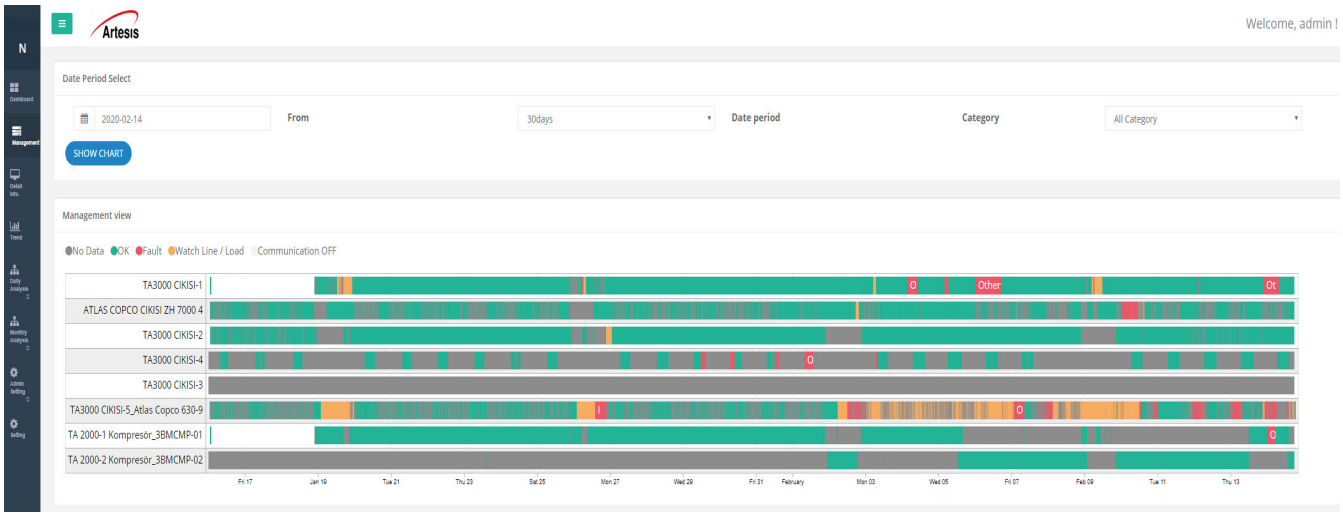


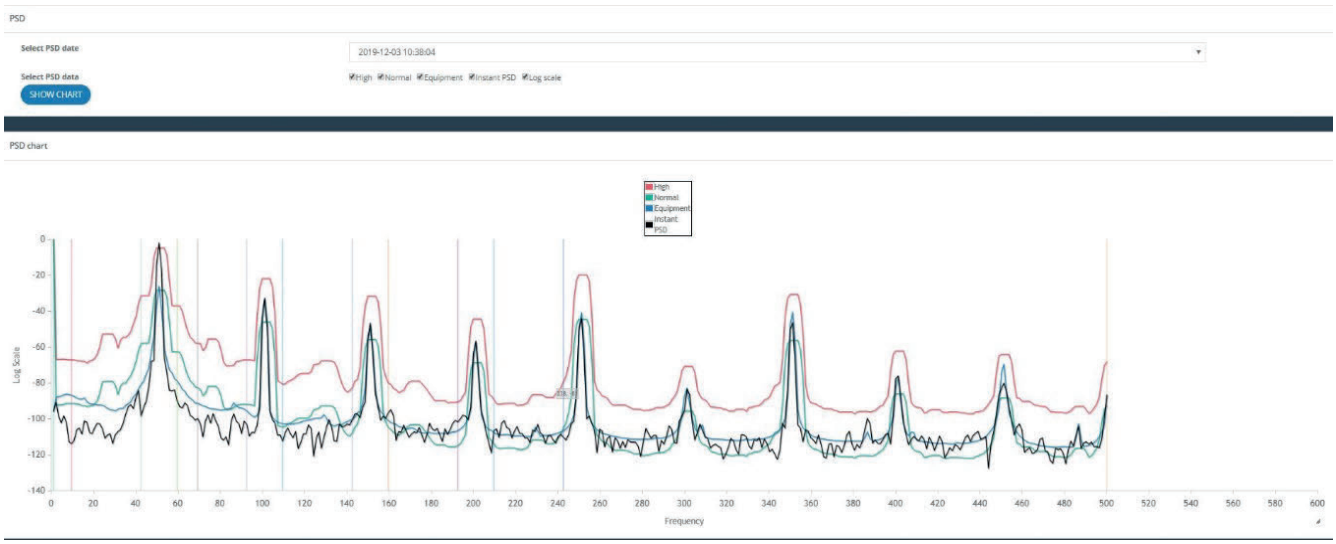
- Multi language support
- Advanced trending tools
- Mail tool for diagnostic alerts
- OPC DA support
- Power spectral density analysis
- 6 channels waveform capture feature

Artesis IOT platform






Artesis
Welcome, admin !
Date Period Select
2020-02-14
From
30days
Date period
Category
All Category
SHOW CHART
Management view
No Data
OK
Fault
Watch Line / Load
Communication OFF
TA3000 CIKISI-1
ATLAS COPCO CIKISI ZH 7000 4
TA3000 CIKISI-2
TA3000 CIKISI-4
TA3000 CIKISI-3
TA3000 CIKISI-5_Atlas Copco 630-9
TA 2000-1 Kompresör_3BMCMP-01
TA 2000-2 Kompresör_3BMCMP-02
Other


PSD
Select PSD date
2019-12-03 10:38:04
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SHOW CHART
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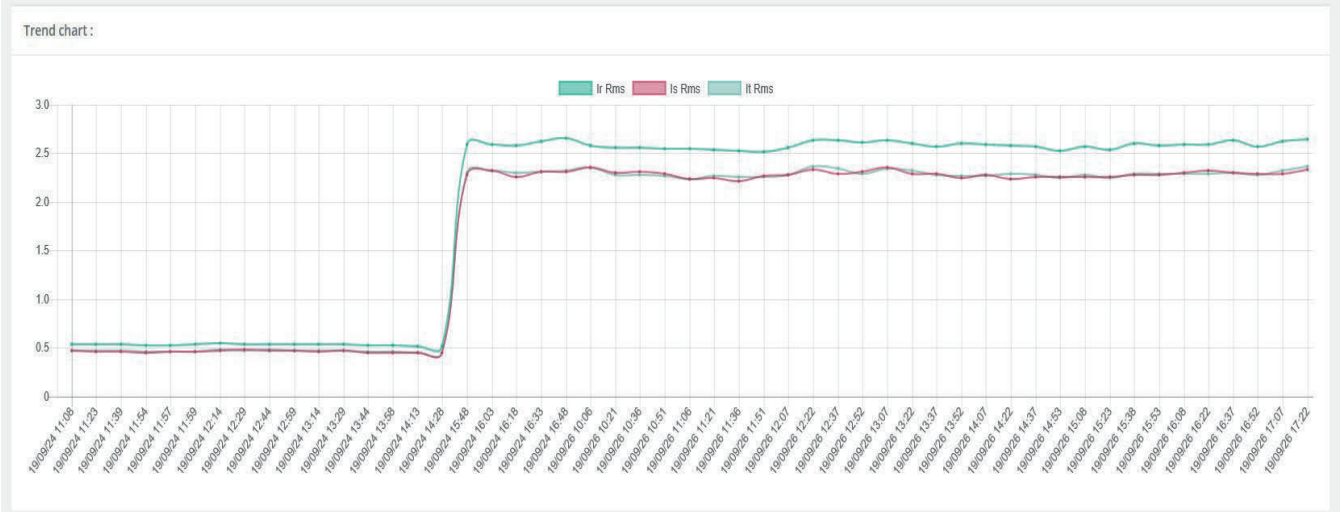
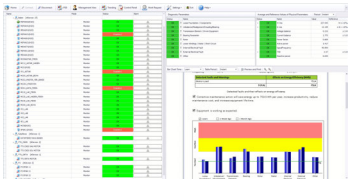

Trend chart :
Ir Rms
Is Rms
It Rms

Products

ITEM	e-MCM	AMT
Product		
Monitoring Type	Online Real time continuous monitoring	Portable Diagnostic Tool
Application	*Low voltage (up to 690V), High voltage (690V - 12000V), Inverter*	
Function	Online Motor condition montioring + Analysis S/W + Power monitoring	Motor diagnosis + Analysis S/W
Monitor	LED Alarm (Normal, Fault), Communication Alarm, Software - Trend Viewer	AMT S/W Report
Feature	Predictive maintenance and fault diagnosis at economical price Energy-saving monitor with power analysis function	Easy Portable diagnostic tool Compatible with Low Voltage, High Voltage, inverter driven motors
Detectable faults	Mechanical unbalance/misalignment Loose foundation Gearbox, belt, coupling Bearing Cavitation, air flow disturbance Stator and rotor faults Motor electrical faults Energy Measurement : V (L-N, L-L) , A, Hz, PF, Unbalance, Power(P,Q,S),	Mechanical unbalance/misalignment Loose foundation Gearbox, belt, coupling Bearing Cavitation, air flow disturbance Stator and rotor faults

Motor fault diagnosis

	Name	Description
Electrical diagnosis	Internal Electrical Fault	Internal electrical fault : rotor / stator, short circuit, insulation, winding
	External Electrical Fault	External electrical fault: Check cable, MC, MCCB accessories and motor wiring
Mechanical diagnosis	Loose Foundation, Component	Loose motor foundation, loose motor components,looseness or excessive tolerances in driven components
	Unbalance, Misalignment	Misalignment, unbalance, bearing, coupling, and motor shaft
	Transmission Element, Driven Equipment	Transmission element(s) coupling, driven equipment, belt, pulley, gear box, and fan / pump impeller
	Bearing	Check bearing
	Rotor	Cracking of the rotor or loosening of the rotor / rotor bar
	Stator related problem	Stator, short circuit, winding looseness, insulation, partial discharge
Load diagnosis	Other Watch Line	Temporary changes in supply voltage cause this alarm. If alarm is persistent check for harmonic levels,capacitors, isolation of cables, motor connector or terminal slackness, loose contactors, etc.
	Watch Load	If the process load has not been altered deliberately, check for leakage, valve & vane adjustment, pressure gauge faults, manometer, dirty filters (fans, compressors). If the process is altered deliberately, device should be updated.

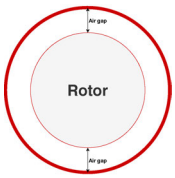
Power meter

	Item	Description
Measurement	Voltage(V) Current (A) Power Factor Frequency (Hz) Power (W) Energy (Wh) Unbalance Leakage Current Sag/Swell THD Harmonic	690V Line-to-line voltage (L1-L2, L2-L3, L3-L1) L1. L2, L3 -99.9 to 100% (PF) 45 - 65 Hz Active/Reactive/Apparent Power Active/Reactive/Apparent Energy Voltage/Current unbalance Over 5mA Leakage current monitoring Min. 1/2 cycle Voltage/Current THD Up to 31 harmonics
Analysis	Analyze equipment efficiency Notify device abnormality Analyze consumption pattern Provide operational strategy	Detailed monitoring, total amount analysis Usage forecasting, real time management, predictive usage analysis Peak power analysis, cumulative usage analysis, comparative graph Performance report, customer report

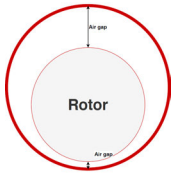
HOW DOES IT WORK?

MODEL BASED FAULT DETECTION

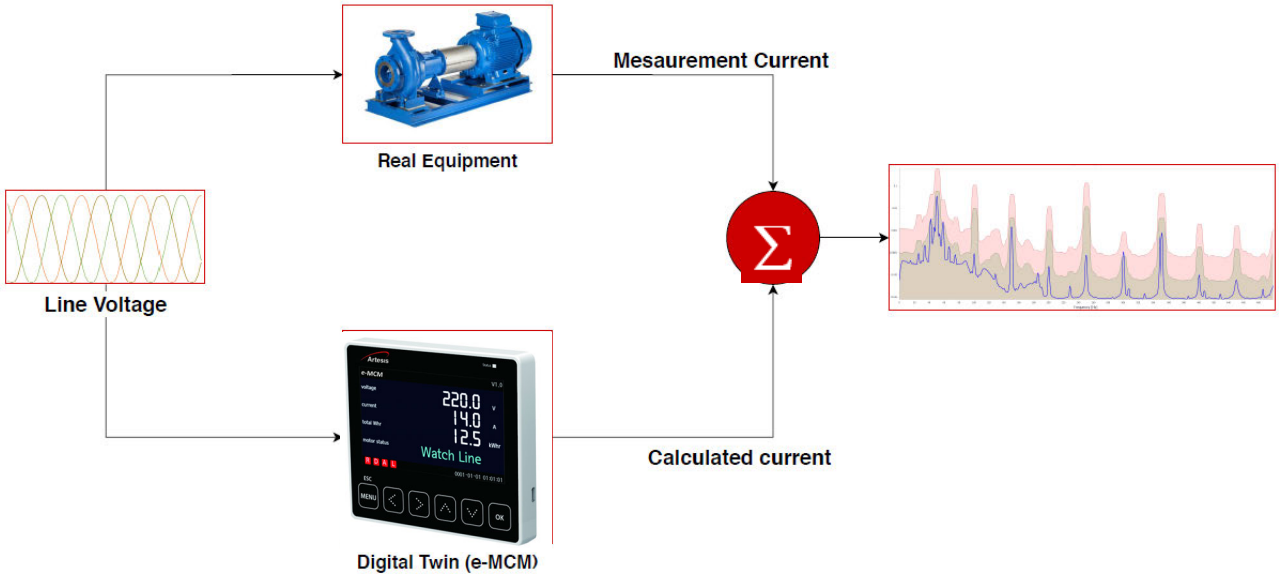
This model-based approach works on the principle that the current drawn by an electric motor is affected by not only the applied voltage but also the behavior of both the motor and the driven equipment. It identifies the distortions of the current waveform that have not been caused by distortions on the voltage waveform and therefore must have been caused by the behavior of the motor and driven equipment system. The frequency of these distortions indicates the nature of the cause, and the magnitude of the distortions indicates the severity of the cause.



Developing faults in the motor or in the equipment connected to it affect both the air gap and torsional dynamics between the motor stator and rotor.

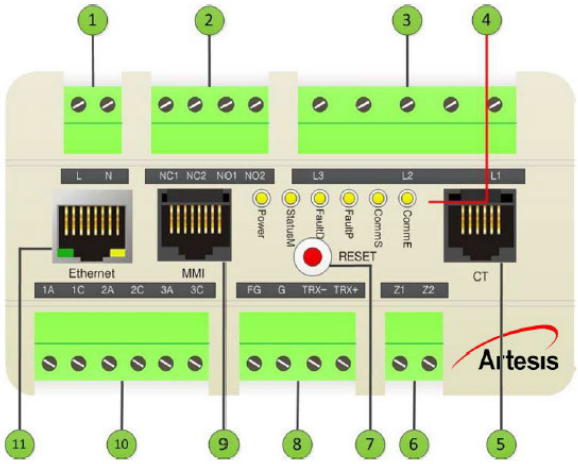


These sensitive variations change the relationship between the motor input and the output signals that are then used by Artesis MCM to detect and diagnose faults.



Model-based approach analyzes the «residual current» – the distortions on the current waveform that have not been caused by distortions on the voltage waveform. This eliminates the dominant supply frequency, and focuses on the signals that indicate the faults right across the spectrum.

e-MCM Motor Condition Monitoring System

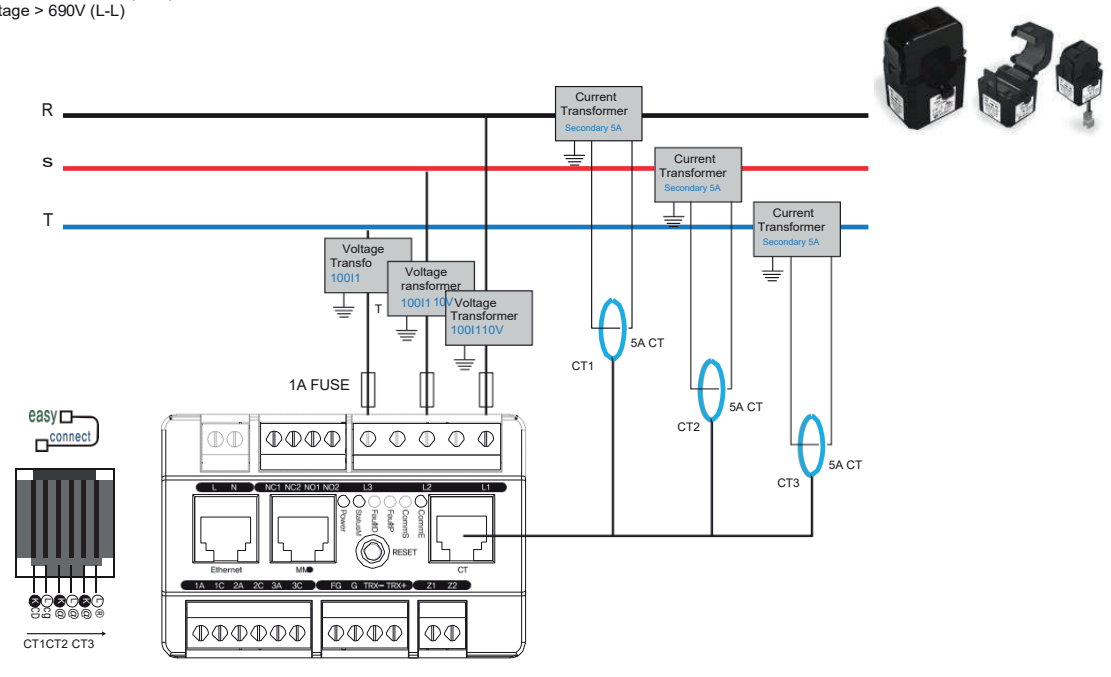


Motor fault diagnosis + Energy management
Predictive Diagnosis of Electrical and Mechanical Faults
(3-phase AC motor) Energy meter function
Measuring parameters : V (L-N, L-L), A, Hz, PF, THD Unbalance, Power
Support Panel display monitor (4.3 "TFT LCD monitor)
RS485 serial communication and Ethernet communication support
EN 60255-26: 2013, EN61010-1: 2010, EN61326-1: 2006
Compact size (94 x 63 x 100 mm)
DIN rail and wall mount available

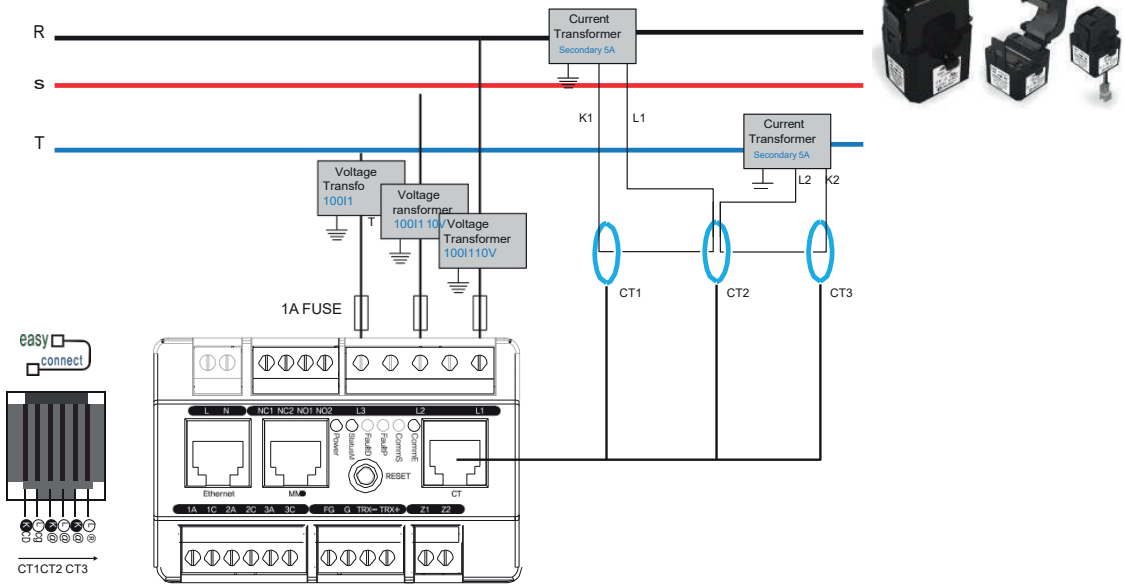
No	Name	Function
1	Supply voltage terminal	Terminal for operational power (AC100~240V)
2	Empty terminal	No Function
3	Motor voltage input	Terminal for motor input voltage
4	Status LED	Indicates Power status, Module status, etc.
5	CT connection port	Terminal for 3 phase CT connection (RJ11)
6	ZCT connection port	Terminal for ground CT connection
7	Reset button	Trip Relay Reset Button
8	RS-485 terminal	Terminal for RS-485 communication
9	HMI terminal	Terminal for connecting with HMI (RJ45)
10	Empty terminal	No Function
11	Ethernet port	Terminal for ethernet communication (RJ45)

e-MCM MV/HV Installation

MV/HV - LINE Installation (3CT)
Motor Voltage > 690V (L-L)

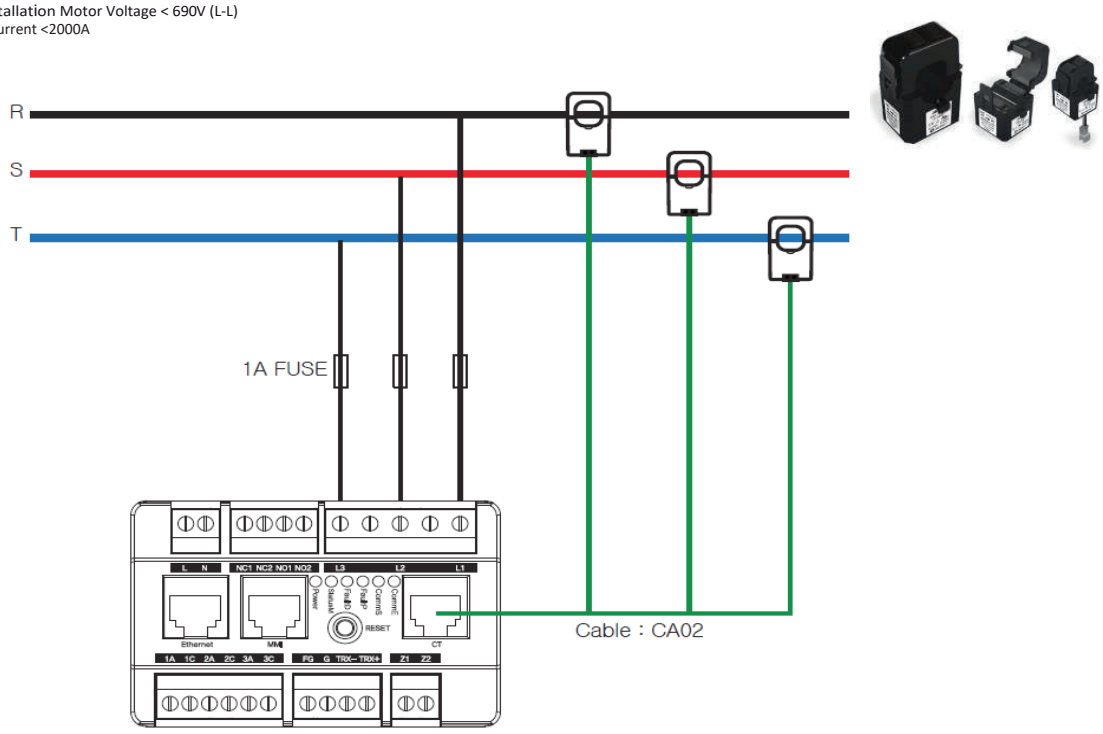


HV - LINE Installation (2CT)
Motor Voltage > 690V (L-L)

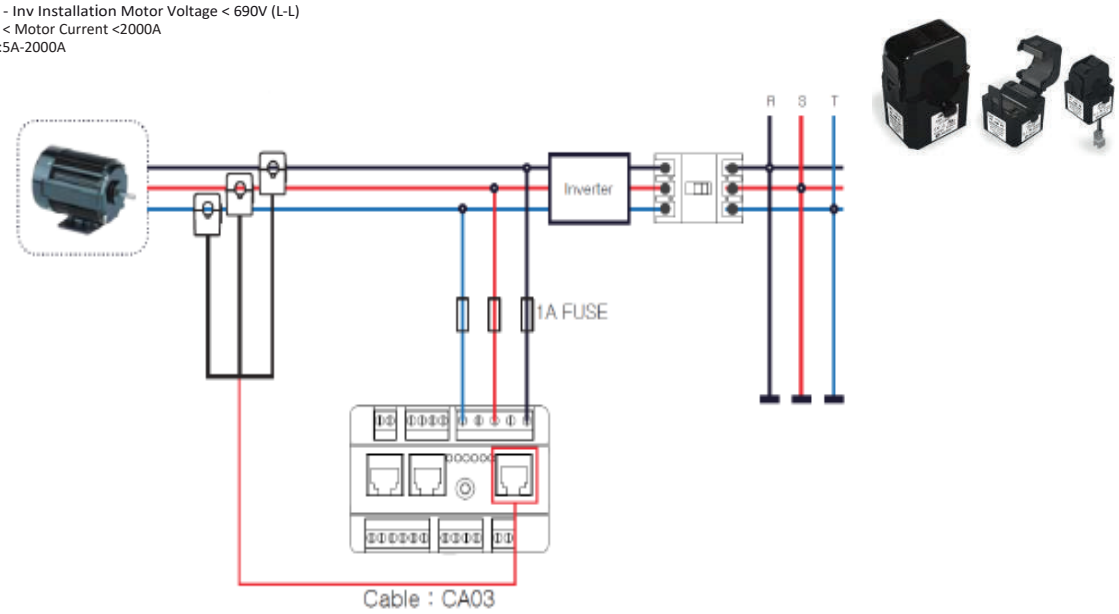


e-MCM LV Installation

LV - LINE Installation Motor Voltage < 690V (L-L)
5A < Motor Current <2000A
CT:5A-2000A

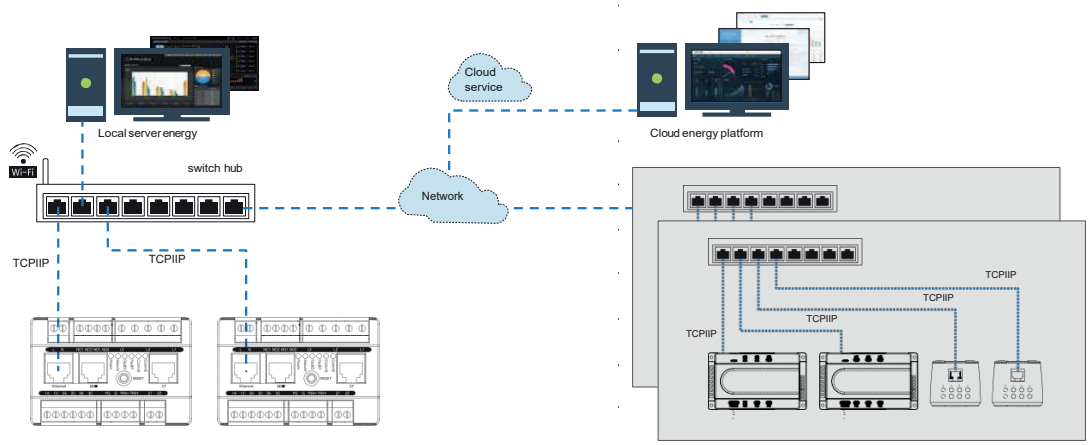


LV - Inv Installation Motor Voltage < 690V (L-L)
5A < Motor Current <2000A
CT:5A-2000A

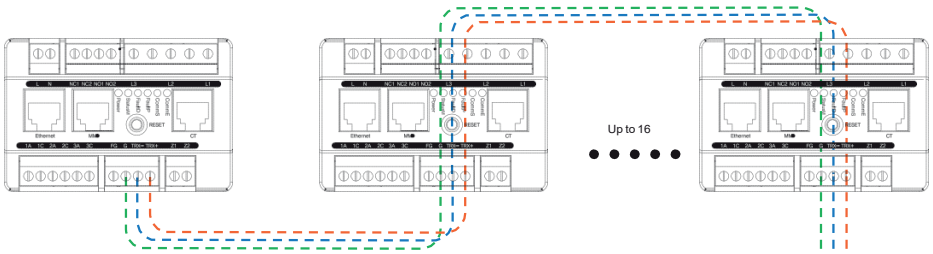


e-MCM Communication Diagram

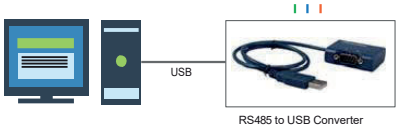
LAN Communication Diagram



Rs-485 communication diagram



Rs-485 pin No.	Description
15	Transmit +
16	Transmit -
17	Ground



Note: The maximum number of connected devices is limited to 16 oth data communication.

Accessory- Split Core Current Transformers

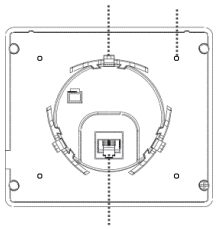
Product Model	Description
AC10R-5-100mA (10.2 Ø)	3x5A -Splitcore current transformers set, (Ø10.2mm) 5A:100mA
AC10R-10-100mA (10.2 Ø)	3x10A -Splitcore current transformers set, (Ø10.2mm) 10A:100mA
AC10R-20-100mA (10.2 Ø)	3x20A -Splitcore current transformers set, (Ø10.2mm) 20A:100mA
AC10R-30-100mA (10.2 Ø)	3x30A -Splitcore current transformers set, (Ø10.2mm) 30A:100mA
AC10R-60-100mA (10.2 Ø)	3x60A -Splitcore current transformers set, (Ø10.2mm) 60A:100mA
AC25R-100-100mA (25 Ø)	3x100A -Splitcore current transformers set, (Ø25mm) 100A:100mA
AC25R-200-100mA (25 Ø)	3x200A -Splitcore current transformers set, (Ø25mm) 200A:100mA
AC25R-250-100mA (25 Ø)	3x250A -Splitcore current transformers set, (Ø25mm) 250A:100mA
AC25R-300-100mA (35 Ø)	3x300A -Splitcore current transformers set, (Ø35mm) 300A:100mA
AC25R-400-100mA (35 Ø)	3x400A -Splitcore current transformers set, (Ø35mm) 400A:100mA
AC25R-600-100mA (35 Ø)	3x600A -Splitcore current transformers set, (Ø35mm) 600A:100mA
AC51R-400-100mA (51 Ø)	3x400A -Splitcore current transformers set, (Ø51mm) 400A:100mA
AC51R-600-100mA (51 Ø)	3x600A -Splitcore current transformers set, (Ø51mm) 600A:100mA
AC51R-800-100mA (51 Ø)	3x800A -Splitcore current transformers set, (Ø51mm) 800A:100mA
AC80R-1000-100mA (80 Ø)	3x1000A -Splitcore current transformers set, (Ø80mm) 1000A:100mA
AC80R-1500-100mA (80 Ø)	3x1500A -Splitcore current transformers set, (Ø80mm) 1500A:100mA
AC105R-1200-100mA (105 Ø)	3x1200A -Splitcore current transformers set, (Ø105mm) 1200A:100mA
AC105R-2000-100mA (105 Ø)	3x2000A -Splitcore current transformers set, (Ø105mm) 2000A:100mA

Accessory - Touch Panel

Panel Display Monitor with 4.3" TFT LCD

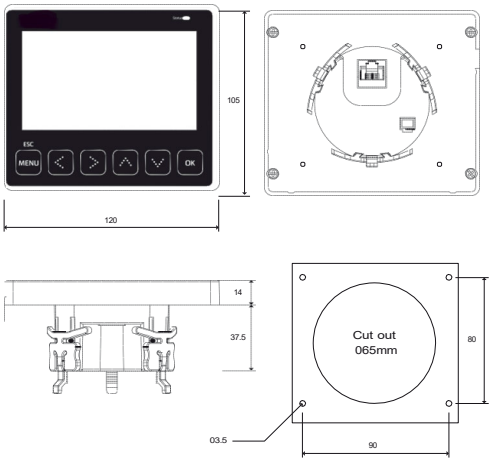
- Used as field monitoring
- On-site power monitoring
- Clear display with 4.3" TFT LCD
- Connect and use with e-MCM device without separate power supply
- Possible to change the setting of the device in the field
- Easy operation with large touch keys

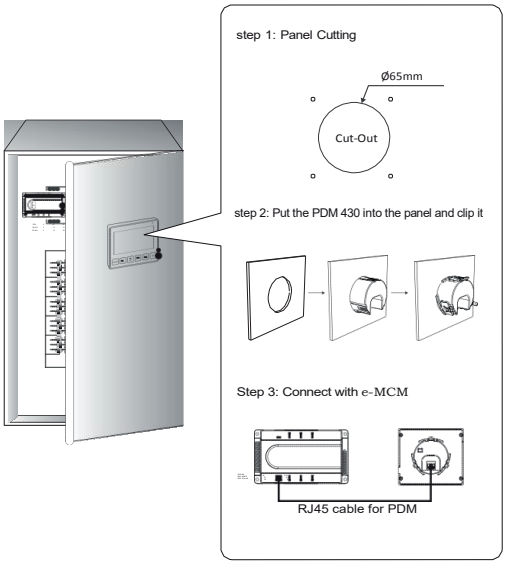
Terminal Description



1	LCD screen	4.3" TFT Color LCD
2	Status LED	Indication of operation status
3	Six keys are used to select display and set	
4	Installation Clip	The clips are used for fixing the PDM to the panel
5	Communication	Communication output to master device (terminal)

Dimensions





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