

PRODUCT GUIDE



Electronic edition – applications

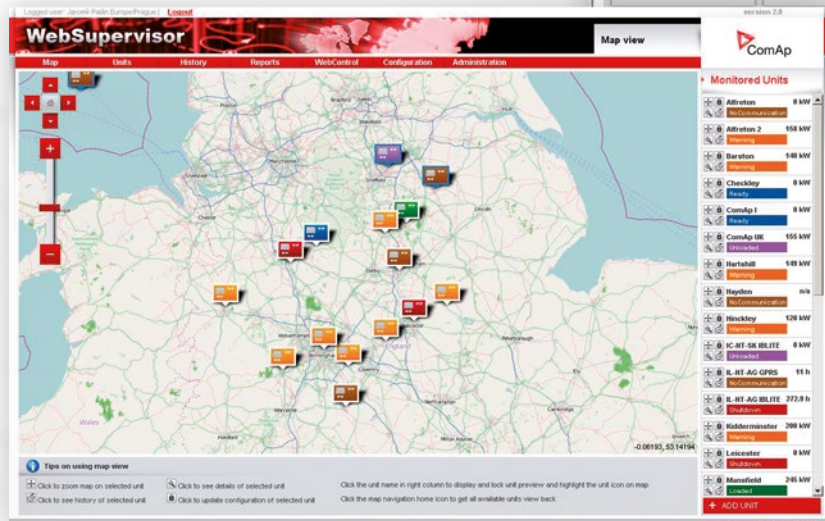
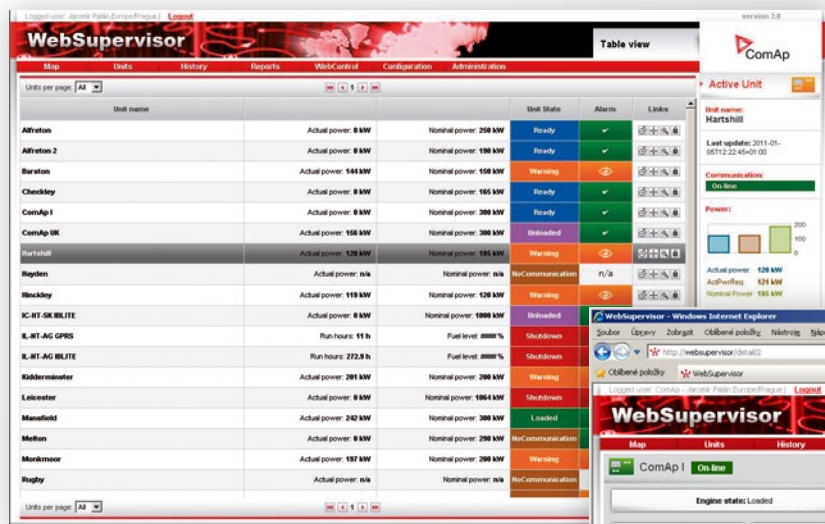




Take control of your gen-set or engine using the free remote monitoring feature

“Smart and easy”

made possible by ComAp unique technology.



**AVAILABLE
IN VARIOUS LANGUAGES**

NEW FEATURE!
Customise your .xls reports
to save time



R E M O T E C O M M S M A D E E A S Y

Control is everything

ComAp is an innovative, creative company bringing power control solutions to industrial applications. Our range of power control products and accessories provide our customers with class-leading technology, ease of use, and environmental benefits.

Our products are in use all over the world, in many different situations: from tyre recycling plants in Turkey, to tomato growers in Australia; from oil rigs in Russia, to a soda factory in Ghana; ComAp products are a reliable and cost effective solution for the world's power control needs.



Spain
Ferry



United Kingdom
Data Center



Ghana
Power Plant



Nigeria
Pasta Factory



USA
Manufacturing Facility



Mexico
Warehouses



Colombia
Oil Field



Ecuador
Cruise Ship



Peru
Ore Mine



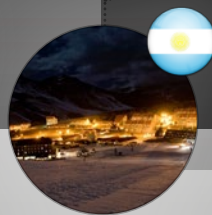
Brazil
Paper Factory



Bolivia
Power Plant



Chile
Casino



Argentina
Ski Centre



Egypt
Cement Production Plant



France
Ship Elevator



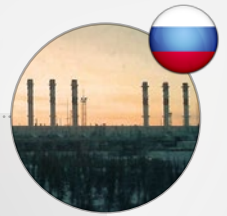
Switzerland
Airport



Poland
Hotel



Kosovo
Telecom Towers



Russia
Oil Field



Denmark
Bank



Finland
Cable Laying Vessel



Italy
Hospital



Romania
Oil Rig



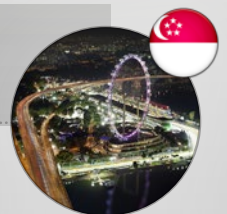
United Arab Emirates
Rental Company



Mongolia
Diesel Power Station



China
Nuclear Power Plant



Singapore
F1 Singapore Grand Prix



Saudi Arabia
Water Treatment Plant



India
Plant Nursery



Indonesia
Coal Mine



Australia
Gas Field



New Zealand
Vineyards and Orchards



WELCOME TO OUR PRODUCT GUIDE

The ComAp Product Guide is more than just an overview of ComAp products – it's an illustration of the continued commitment of the many dedicated people at ComAp who continually develop new ways to support an ever-growing range of solutions for an ever-increasing global customer base.

As a result the guide is bigger and better than ever. It promises a flexible approach to engine and generator management through solutions deeply embedded with the latest web based communication technology to bring unrivalled efficiency, convenience and cost saving to standard operations. We've also extended our range and capability further with updated software, touch screen technology, bi-fuel packages and a family of compact and cost-effective control units.

Beyond innovative products, ComAp customers can be sure of outstanding service. Our global distribution network is dedicated to delivering an excellent experience with fully trained and knowledgeable partners providing responsive technical support where and when it's needed anywhere in the world.

We hope you find the guide useful and continue to be an important part of our future. Hearing what you think is very important to us, so if you would like to share your experience of using our products please let us know by emailing your story to info@comap.cz.

Regards
Libor Mertl – Managing Director

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Applications

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Gen-set controllers applications

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Generator controllers applications

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ATS controllers applications

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Mains protections applications

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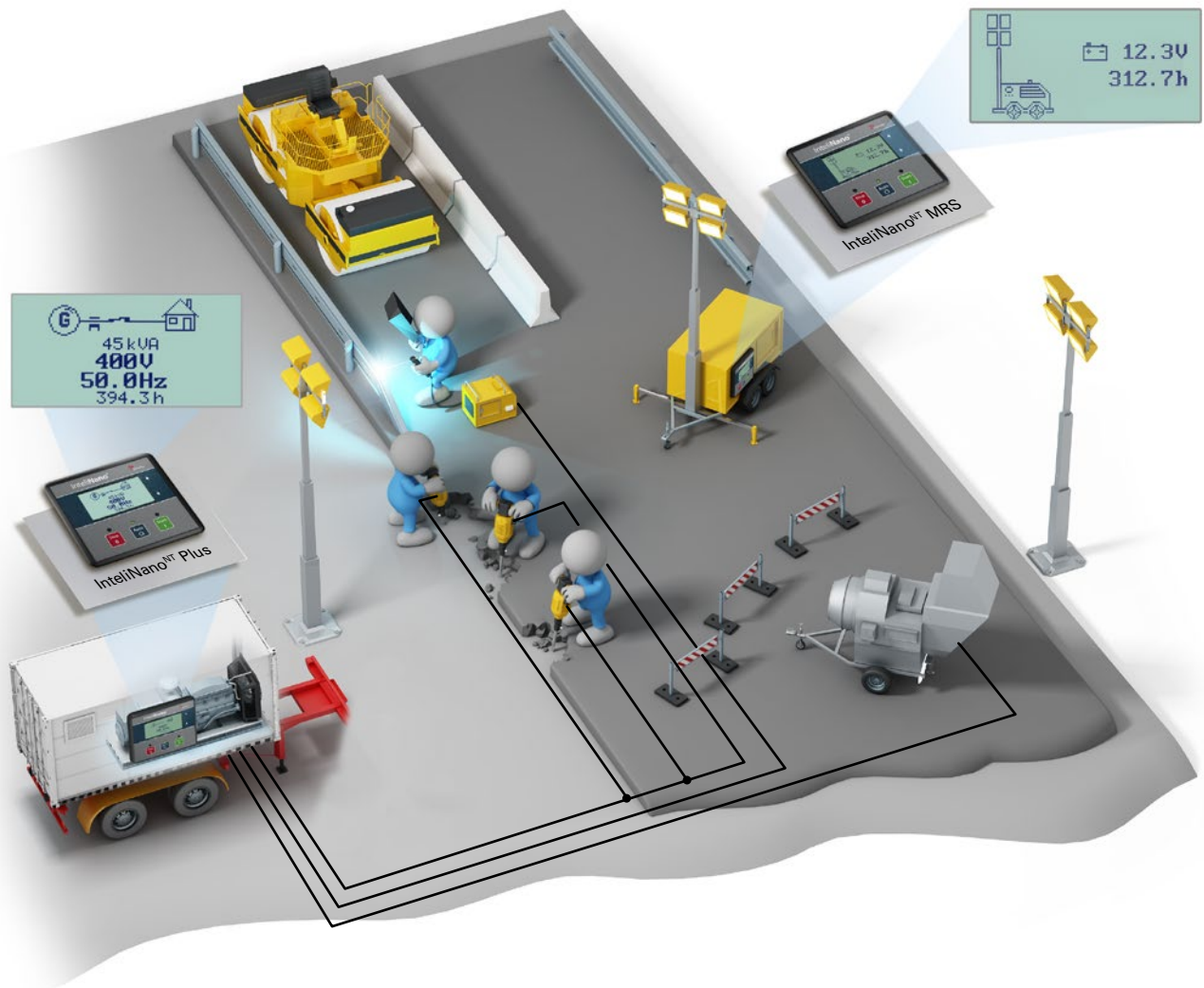
Engine controllers applications

120

Bi-fuel products applications



Prime power system



Description:

- Manual and remote start for gen-sets with electronic engines.
- IntelliNano^{NT} MRS starts, controls and monitors the gen-set and controls the circuit breaker to supply the load.
- The generator is protected by built in over/under voltage and frequency protection systems.
- The controller communicates with the engine management unit via a CAN J1939 bus and shows engine values and alarms on a graphical LCD screen.
- The controller enters sleep mode when the generator is not being used, allowing extended battery life for the unit.
- Special LCD screen for Light tower support.
- Current Measurement is the key feature of the IntelliNano^{NT} Plus, allowing the user to maximise engine power.

Scope of supply:

- 1x IntelliNano^{NT} MRS
- 1x IntelliNano^{NT} Plus



Prime power system – remote monitoring via Internet



Description:

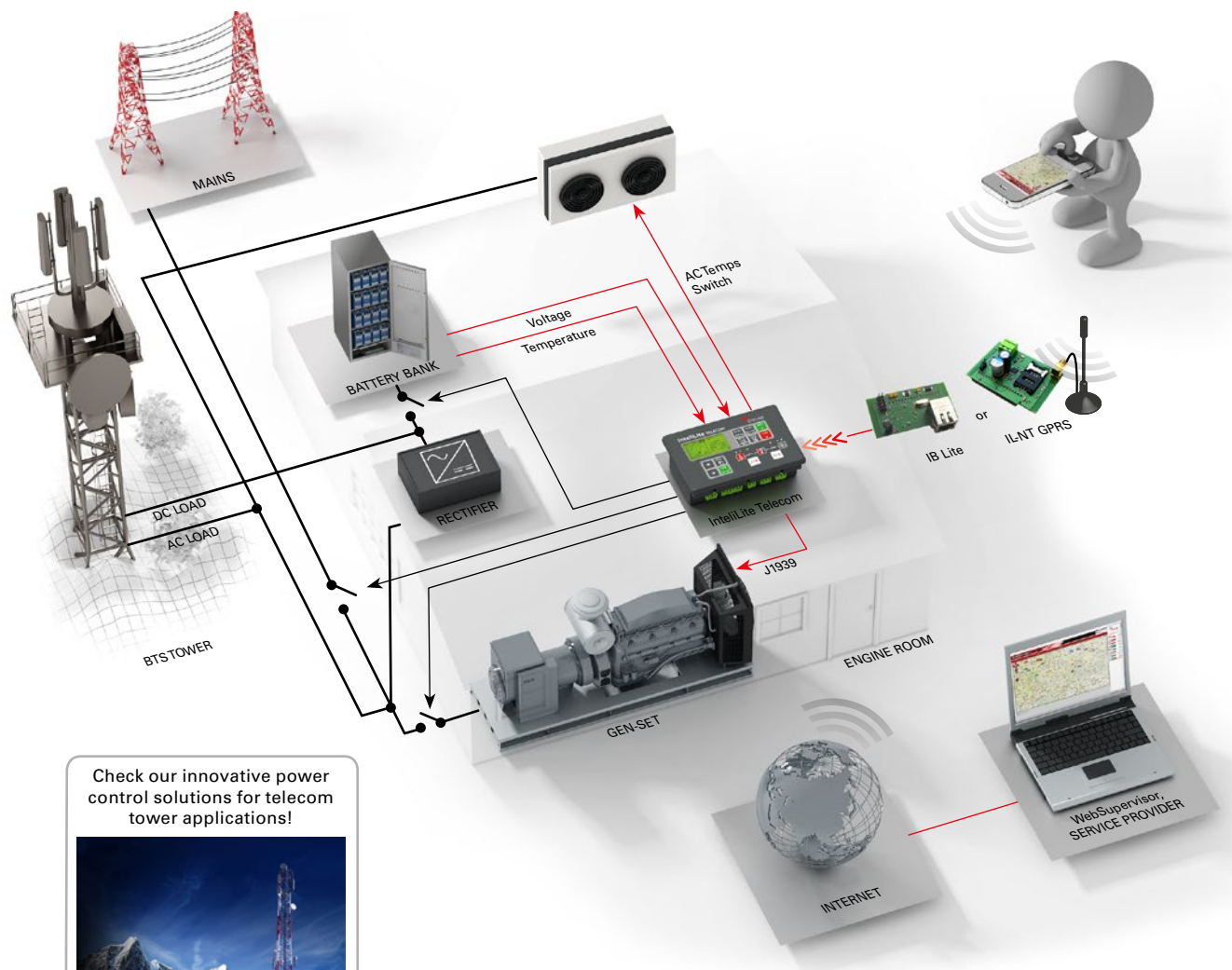
- Manual and remote start of gen-set with electronic engine.
- IntelliLite^{NT} MRS 16 starts, controls and monitors the gen-set and controls the circuit breaker to supply the load.
- Service provider can monitor and control gen-set operation remotely via Internet.
- Controller sends active E-mails upon alarm event.
- The generator is protected by a built in over/under voltage and frequency protections as well as IDMT overcurrent protection.
- The controller communicates with engine management unit by a CAN J1939 bus. Engine values and alarms are visible on a graphical LCD screen in plain language – no need to learn cryptic flashing or numeric error codes.

Scope of supply:

- 1x IntelliLite^{NT} MRS 16
- 1x IB-Lite



AC cycling system for telecom towers



Check our innovative power control solutions for telecom tower applications!



Description:

- ComAp AC cycling system including IntelliLiteTelecom offers significant OPEX savings.
- Start/Stop based on battery bank voltage ensures the telecom tower is always powered most efficiently.
- Generating-set only used to charge batteries meaning reduced run-hours and smaller cost-effective generating-set can be used.
- Remote monitoring for optimal service intervals, fault reporting and reduced operating costs (OPEX).

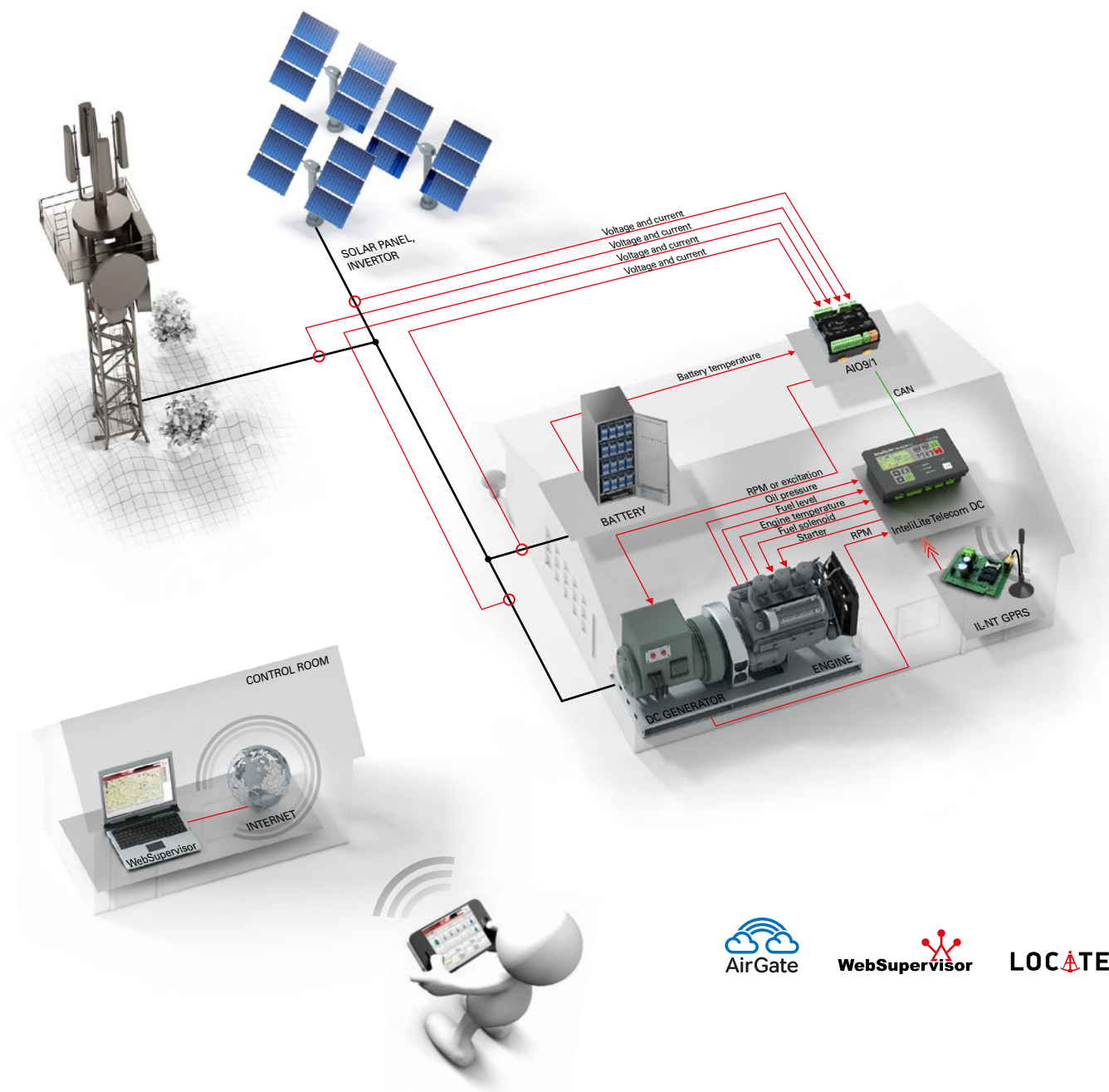
Scope of supply:

- 1x IntelliLiteTelecom
- 1x IB-Lite or IL-NT GPRS





DC cycling for telecom towers



Description:

- Use a ComAp system including IntelLite Telecom DC to efficiently control your DC variable speed generating-set, renewable DC power source and battery for a reliable and cost-effective off-grid solution.
- Due to higher efficiency DC cycling solution can deliver significant OPEX savings when compared to AC cycling solution.
- Remote monitoring for optimal service intervals, fault reporting and reduced operating costs (OPEX).

Scope of supply:

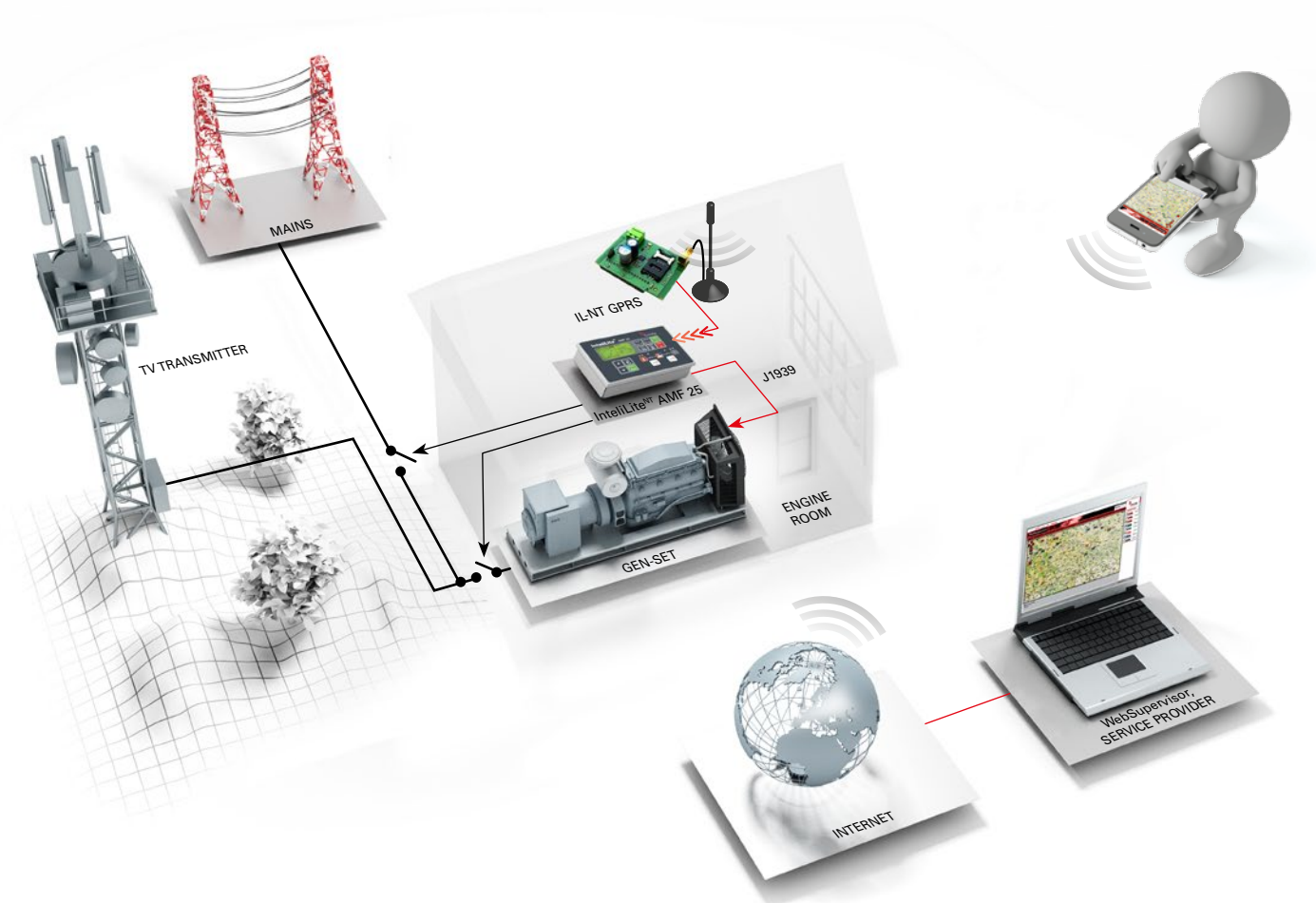
- 1x IntelLite Telecom DC
- 1x AIO9/1
- 1x IL-NT GPRS





Standby system

– remote monitoring via Internet



Description:

- Stand-by gen-set with electronic engine.
- IntelliLite^{NT} AMF 25 continuously monitors a mains supply and automatically starts an engine and switches load to a standby generator set in case of mains failure.
- The service provider can monitor the gen-set operation remotely via GPRS modem.
- The operator can use LiteEdit for a single gen-set view or WebSupervisor for total fleet management.
- The generator is protected by a built in over/under voltage and frequency protections as well as IDMT overcurrent protection.
- The controller communicates with engine management unit by a CAN J1939 bus. Engine values and alarms are visible on a graphical LCD screen in plain language – no need to learn cryptic flashing or numeric error codes.

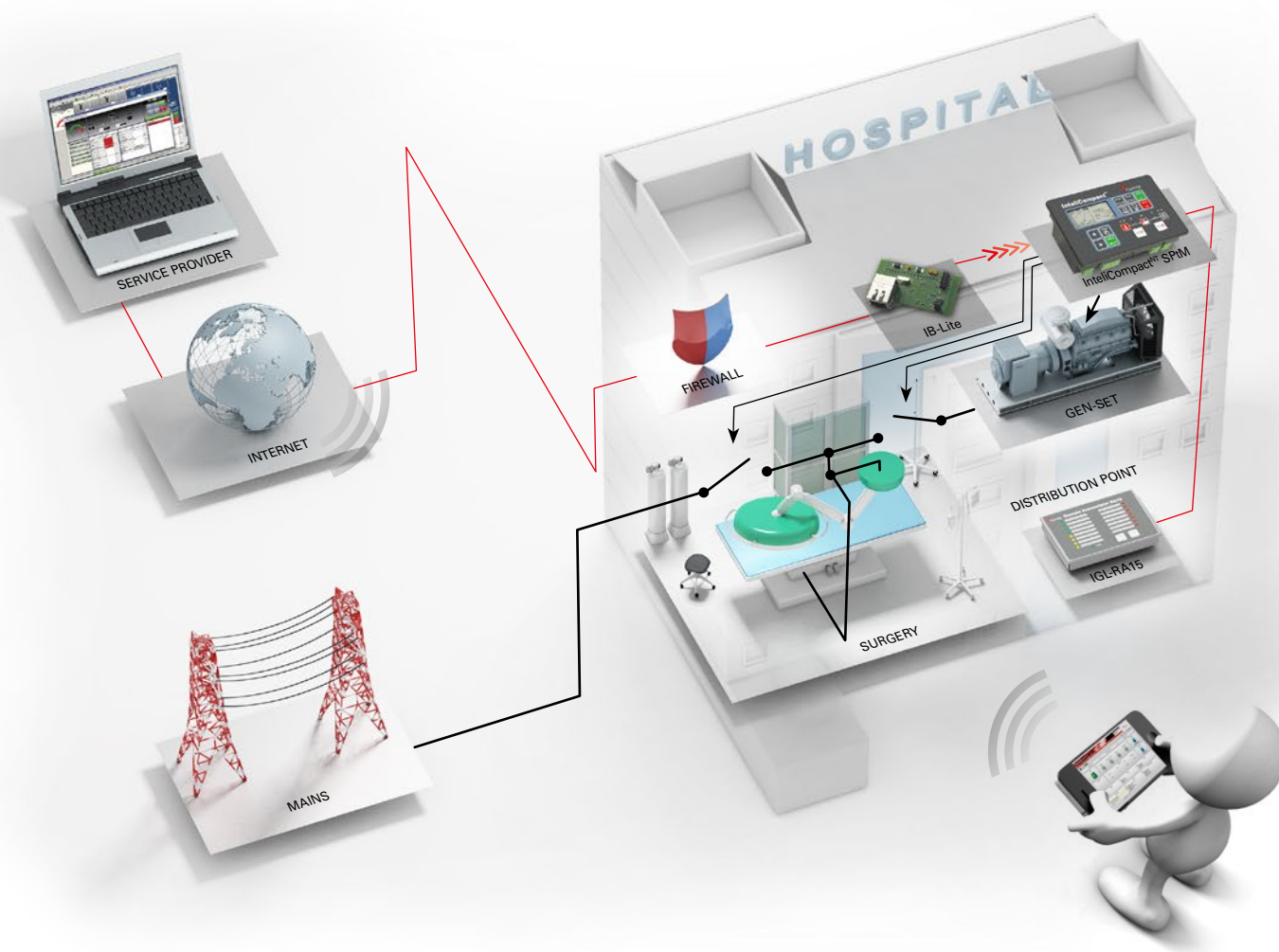
Scope of supply:

- 1x IntelliLite^{NT} AMF 25
- 1x IL-NT GPRS



Standby system with soft return

– remote monitoring and control via Internet



Description:

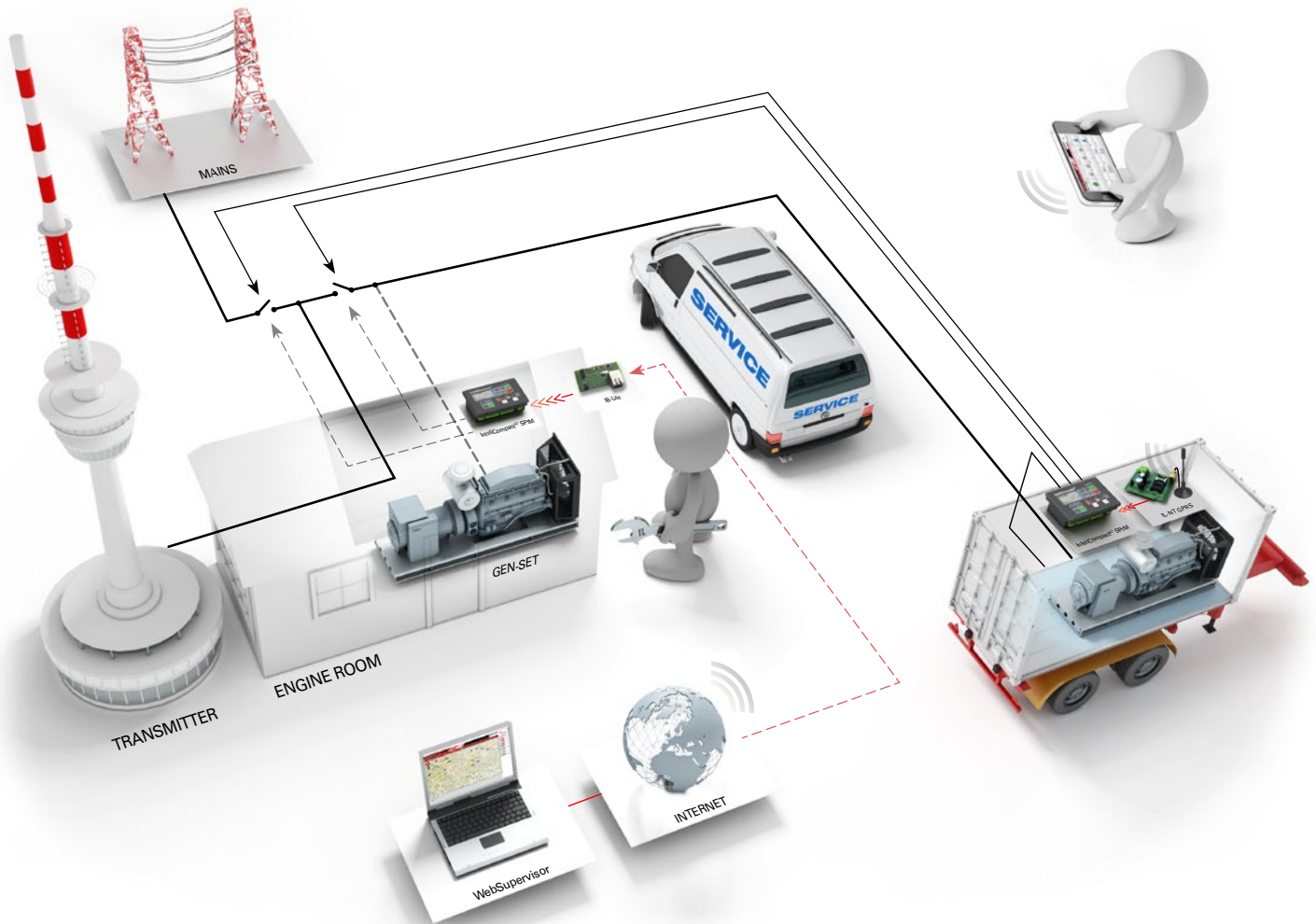
- Stand-by emergency gen-set accomplishes power supply to essential load during power drop.
- The controller automatically starts the gen-set in case of mains failure and switches load to generator. When mains power returns, it synchronizes the generator back, softly unloads it and stops the engine.
- Generator automatically synchronizes to mains in Test mode. Test mode can be used to check the gen-set condition and to provide uninterrupted power supply in case of expected mains failure.
- Status of the gen-set is displayed in the distribution point.
- IntelliMonitor is used for remote monitoring and control; connected via IB-Lite.
- History file with performance log stored in IntelliCompact^{NT} SPtM allows easy backtracking and problem solving.
- Seamless communication with engine's electronic injection control unit, all important values and alarms are visible on screen of IntelliCompact^{NT} and stored to the history file in plain language.

Scope of supply:

- 1x IntelliCompact^{NT} SPtM
- 1x IG-AVRi
- 1x IG-AVRi-TRANS/LV
- 1x IB-Lite
- 1x IGL-RA15



Rental standby system with soft return



Description:

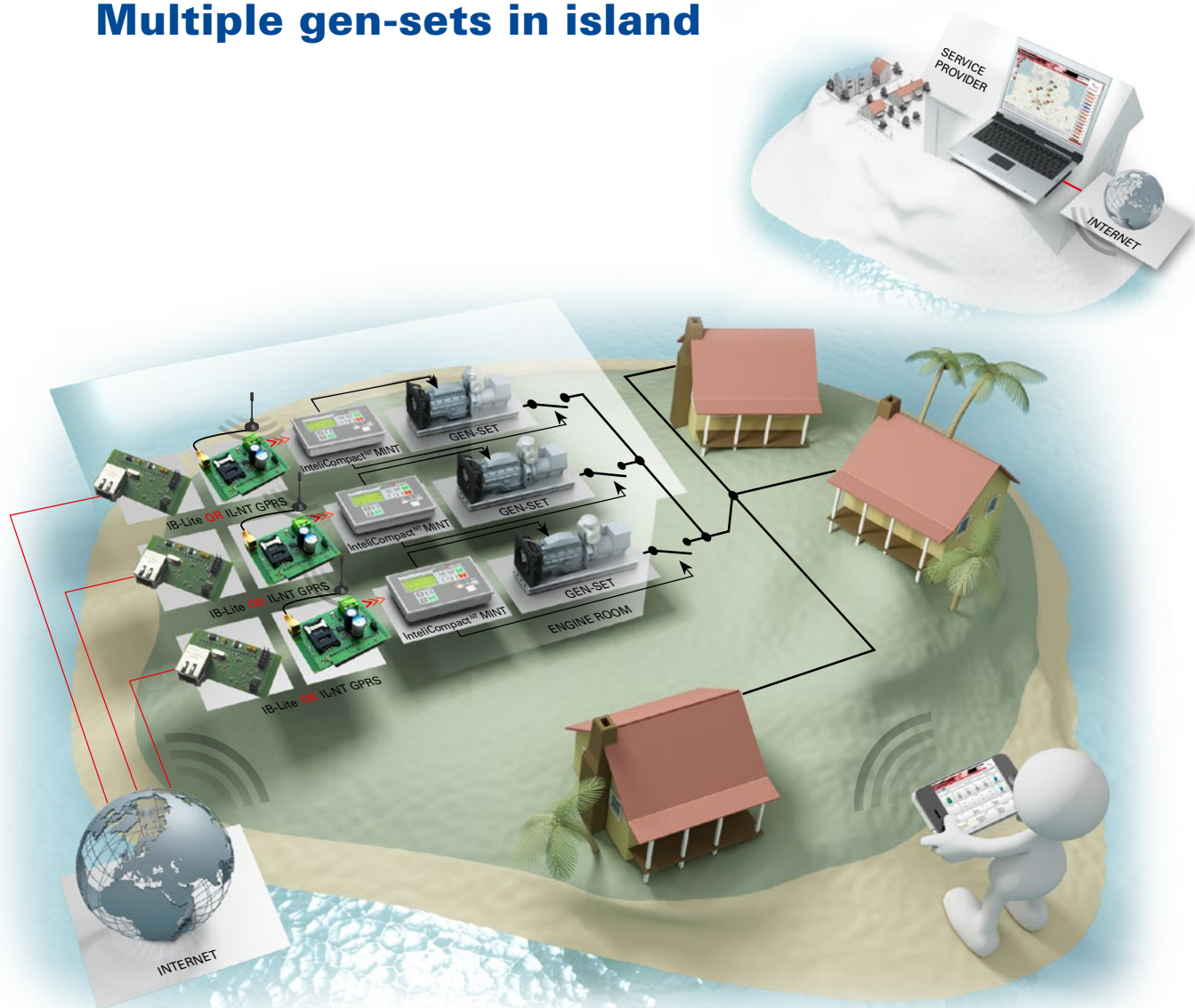
- Rental stand-by emergency gen-set to provide power to essential services during a power drop, as a backup to a common stand-by system.
- The controller automatically starts the gen-set in case of mains failure and switches the load to the generator. When mains power returns, it synchronizes the generator back, softly unloads it and stops the engine.
- The generator automatically synchronizes to the mains in its Test mode. The Test mode can be used to check the gen-set condition and to provide uninterrupted power supply in case of expected mains failure.
- The status of the gen-set is displayed at the distribution point and can also be monitored via smartphone.
- WebSupervisor is used for remote monitoring and control; connected via an IL-NT GPRS. It is also possible to control localization and sequential movement of a rental gen-set.
- History file with performance log stored in IntelliCompact^{NT} SPtM allows easy backtracking and problem solving.
- Seamless communication with the engine's electronic injection control unit, all important values and alarms are visible on screen of IntelliCompact^{NT} and stored to the history file in plain language.
- The function of FuelTheft is to monitor fuel levels, and provide notification alarms in case of fuel theft or fuel leak.

Scope of supply:

- 2x IntelliCompact^{NT} SPtM
- 1x IB-Lite
- 1x IL-NT GPRS
- 2x IG-AVRi
- 2x IG-AVRi-TRANS/LV



Multiple gen-sets in island



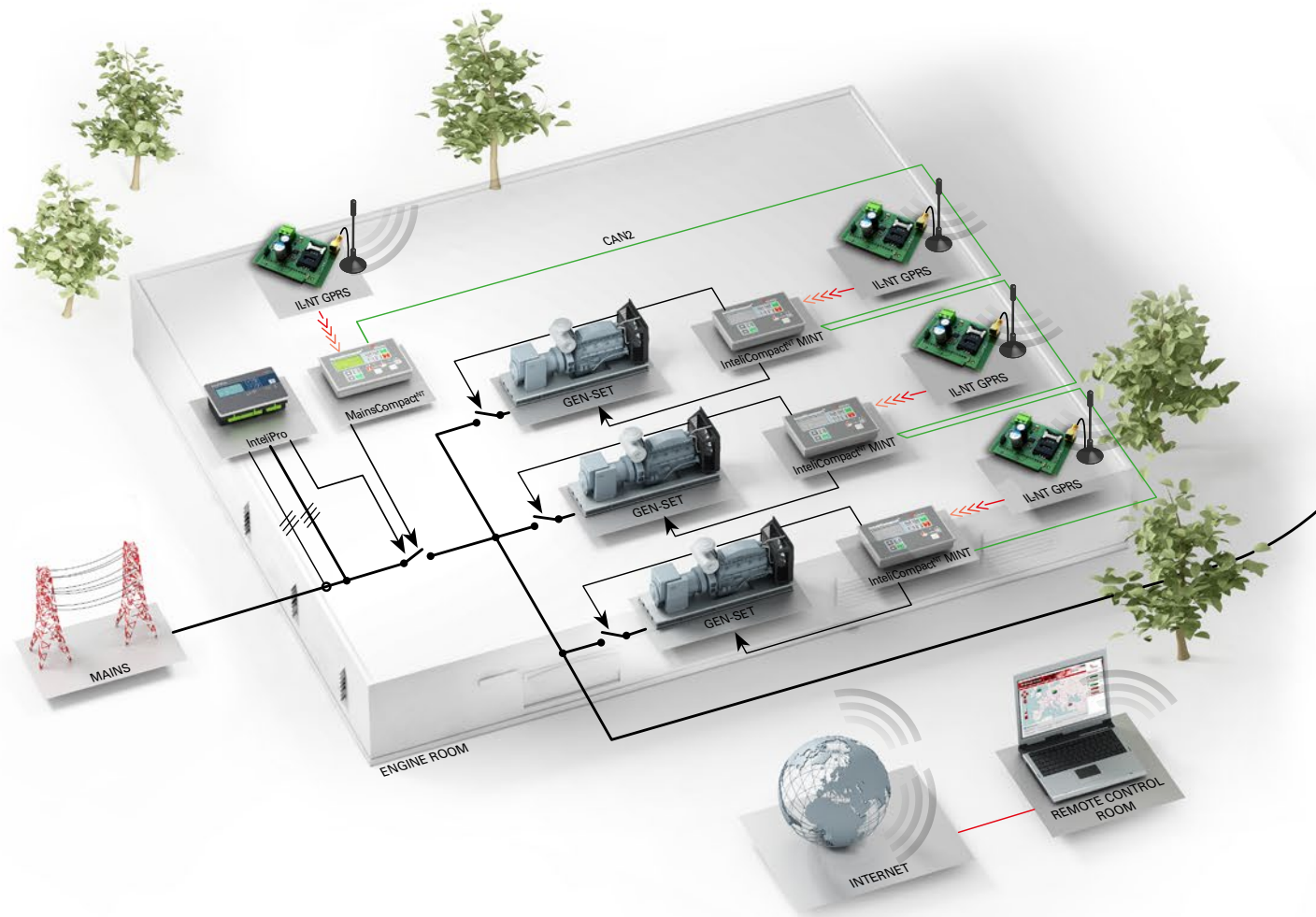
Description:

- For use in a fully independent, non-grid connected system, which is the only available power source.
- Automatic forward and reverse synchronization with soft load ramp-up and ramp-down during changeover.
- In built Power management system, enabling automatic optimization of number of running gen-sets according to load (including Run Hours equalization).
- Remote control and monitoring via IL-NT GPRS or IB-Lite (easy with AirGate technology).
- WebSupervisor or LiteEdit can be used for remote monitoring and control.
- Wide range of engine and generator protections, including vector-shift protection, loss of excitation and earth fault current protection.
- Option to control the gen-sets via SMS.
- Extensive history file, with performance log, stored in IntelliCompact^{NT} MINT allows easy backtracking and problem solving.
- Seamless communication with the engine's electronic injection control unit, all important values and alarms are visible on the IntelliCompact^{NT} screen and stored to the history file in plain language.

Scope of supply:

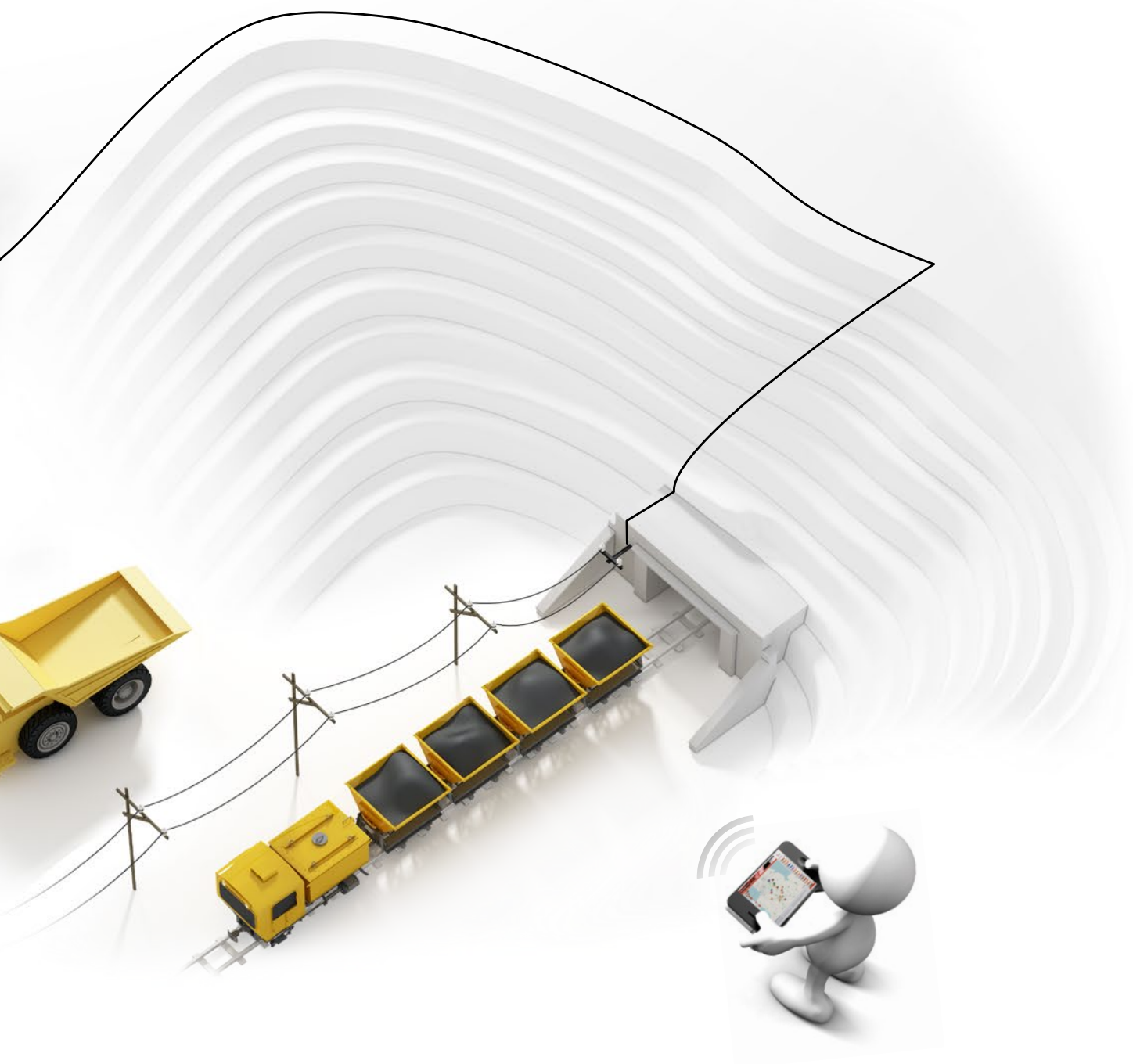
- 3x IntelliCompact^{NT} MINT
- 3x IB-Lite or IL-NT GPRS
- 3x IG-AVRi
- 3x IG-AVRi-TRANS/LV

Multiple gen-sets in parallel to grid – remote monitoring and control via Internet



Description:

- Fully automatic system reduces electric energy bill by keeping the mains power below high tariff level during peak hours.
- At the same time it accomplishes emergency standby power in case of mains failure.
- Remote control and monitoring via IL-NT GPRS.
- WebSupervisor is used for remote monitoring.
- Wide range of engine and generator protections, including vector-shift protection, loss of excitation and earth fault current protection.
- Automatic forward and reverse synchronization with soft load ramp-up and ramp-down during changeover.
- Common synchronization of IntelliCompact^{NT} MINT controllers provided by MainsCompact^{NT}.
- Active and reactive load import/export control and load-sharing.
- Automatic optimization of number of running sets according to load (including Run Hours equalization).
- Peak shaving controlled by built in Scheduler, engines automatically run during peak period.
- History file with performance log stored in IntelliCompact^{NT} MINT allows easy backtracking and problem solving.
- Seamless communication with engine's electronic injection control unit, all important values and alarms are visible on screen of IntelliCompact^{NT} and stored to the history file in plain language.
- Mains protection IntelliPro provides wider range of protective features for higher reliability and increased safety of the system operation.

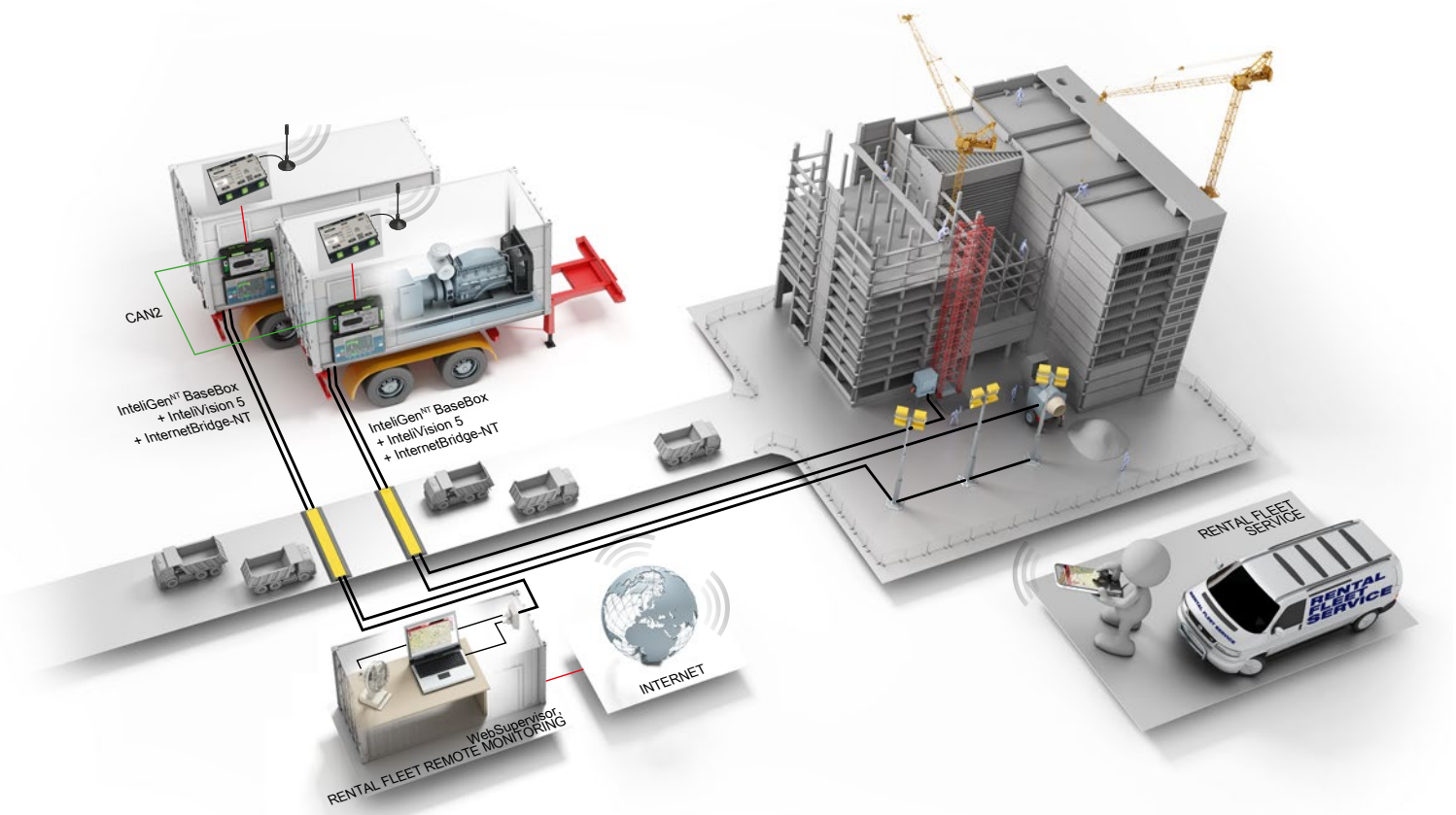


Scope of supply:

- 3x IntelliCompact^{NT} MINT
- 3x IG-AVRi
- 3x IG-AVRi-TRANS/LV
- 1x MainsCompact^{NT}
- 4x IL-NT GPRS
- 1x IntelliPro



Rental sets



Description:

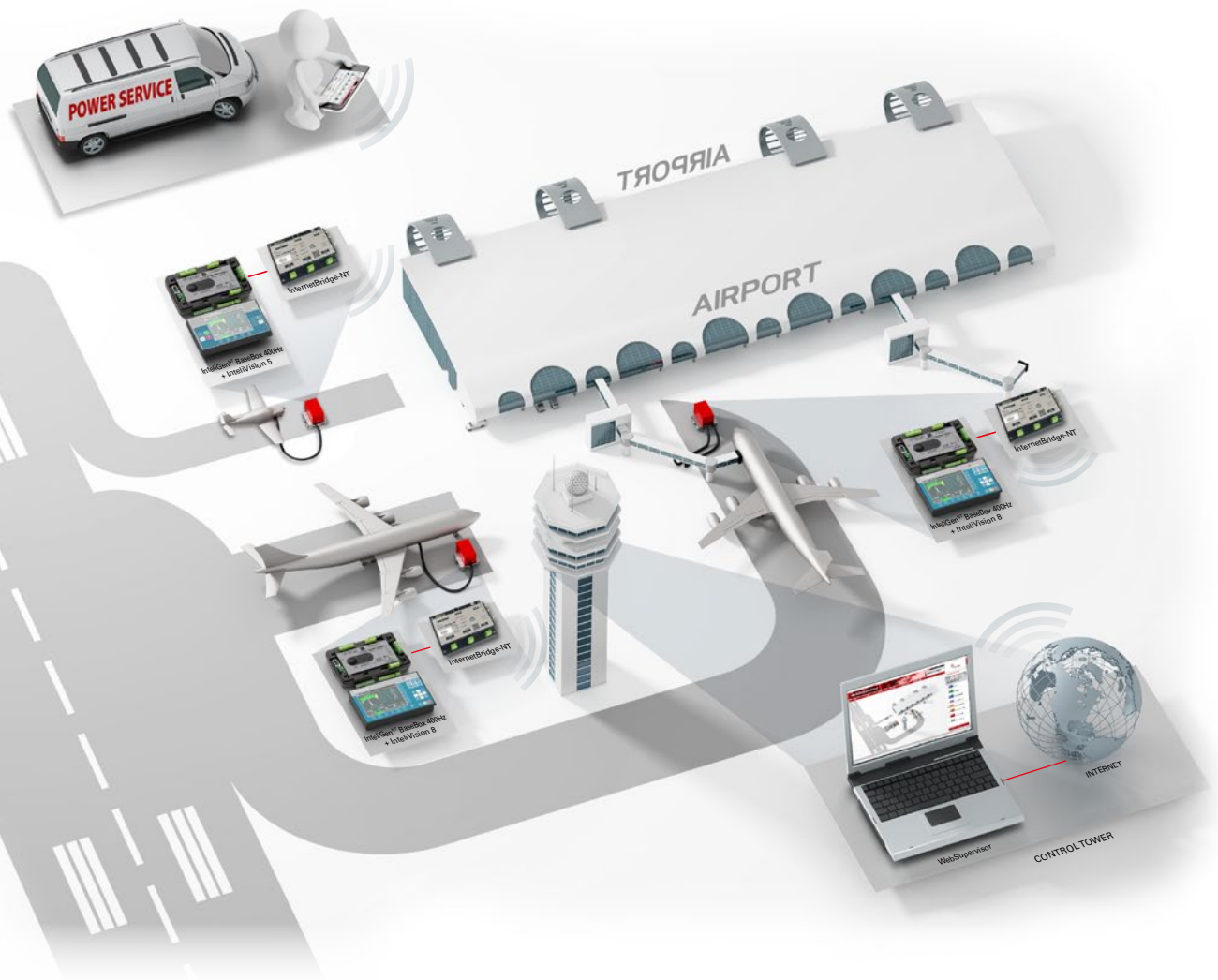
- Containerized rental gen-sets are deployed as temporary and mobile power generation units providing essential energy for subsystems and construction machinery on building projects or civil engineering applications where mains power is not available or has been manually disconnected.
- The application shows rental gen-sets fitted with the latest remote communication module InternetBridge-NT which enables the central control facility and mobile service engineers to efficiently monitor, control and supervise equipment wherever it is located. By using the supportive cloud-based software applications such as WebSupervisor, rental operators can significantly improve operational control.
- Each gen-set can be used in Stand-by, Single parallel to mains and Multiple parallel modes according to the position of Mode selector switch.
- Load sharing and VAR sharing can be conditionally switched from isochronous regulation to droop. It ensures reliable operation in case of cut off the CAN intercontroller communication line or cooperation with the gen-sets equipped with third-party control system.

Scope of supply:

- 2x IntelliGen^{NT} BaseBox
- 2x IntelliVision 5
- 2x InternetBridge-NT
- 2x IG-AVRi
- 2x IG-AVRi-TRANS/LV



Ground power unit for aircraft



Description:

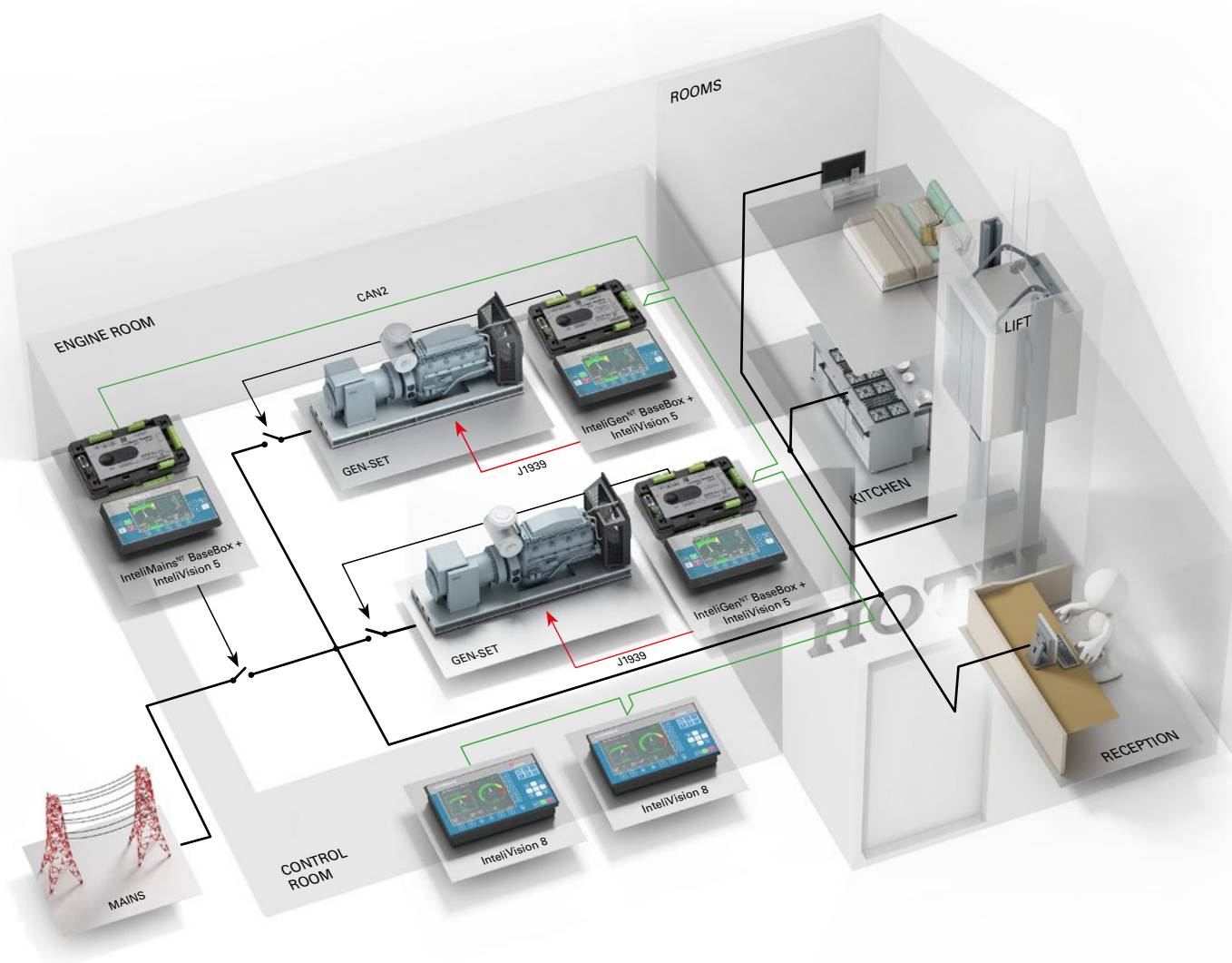
- Large aircraft are fitted with an auxiliary power unit (APU or GPU) providing power when they are on the ground. However many airports require this to be turned off, when the airplane is docked.
- So that the aircraft systems can still operate whilst the APU is off, power is provided by a ground power unit (GPU). This in turn means that the engines to the plane are turned off and thus noise is eliminated, saving fuel costs and dispersing any type of emissions.
- The ComAp 400Hz controller is tailored to applications where large stationary aircraft require synchronizing and power management whilst operating on an AC electrical system at 400Hz frequency.
- The IntelliGen^{NT} BaseBox 400Hz, with support engines with ECU's (Electronic Control Units), and work in conjunction with detachable colour displays IntelliVision 5 or IntelliVision 8 which can be connected with InternetBridge-NT using AirGate and WebSupervisor – to provide remote administration and maintenance of all GPU powered aircraft on the ground.
- This can then relay information to a central or mobile location such as where the GPUs are located in the airport, if they are connected and powering the aircraft, and how much fuel is in the gen-set tank – ensuring that engineers remain connected to the system at all times.

Scope of supply:

- 3x IntelliGen^{NT} BaseBox 400Hz
- 1x IntelliVision 5
- 2x IntelliVision 8
- 3x InternetBridge-NT



Standby system with load shedding – advanced displays



Description:

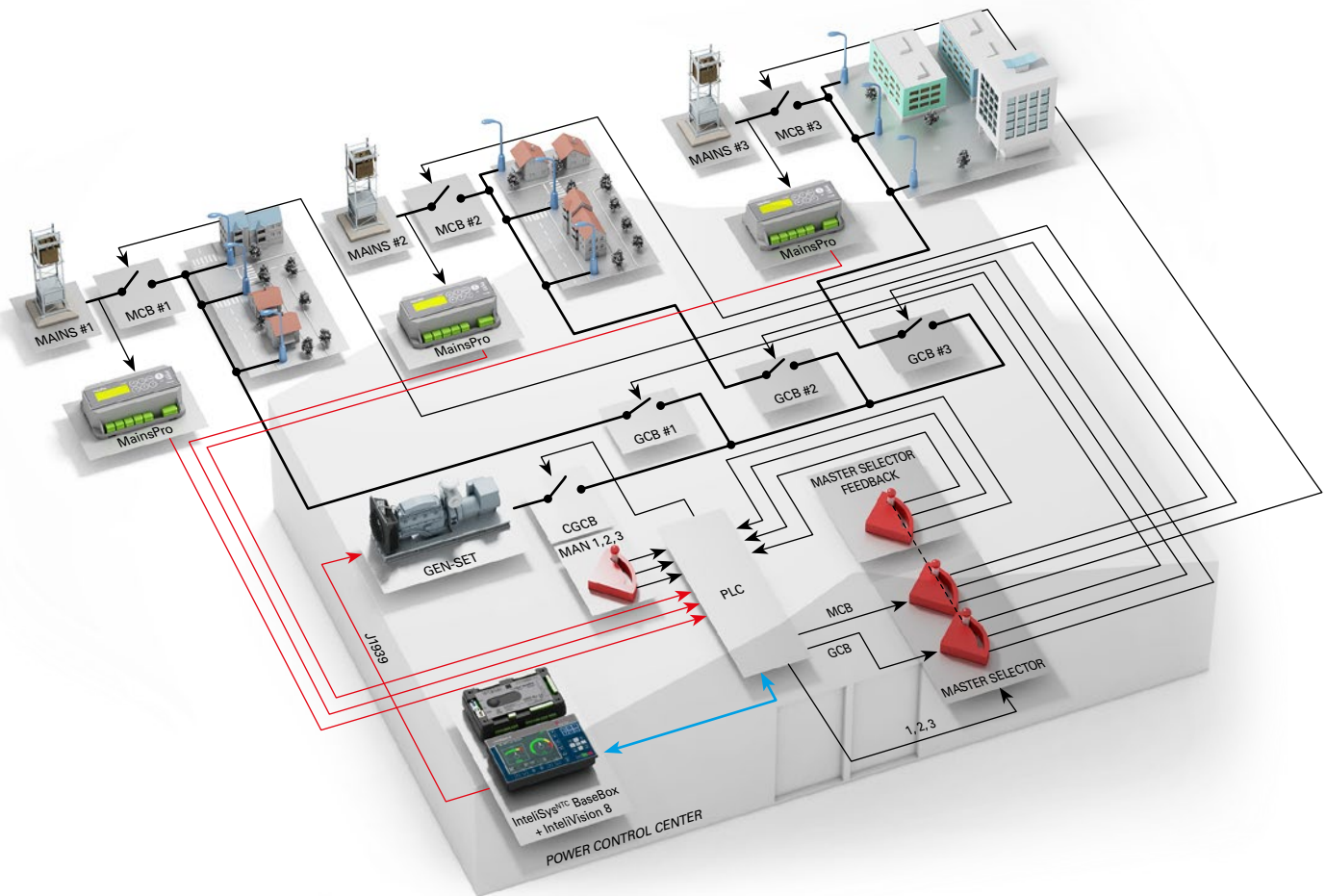
- The system guarantees emergency standby power in case of mains failure.
- IntelliMains^{NT} BaseBox provides AMF function and activates mains to gen-sets changeover in the case of mains failure no break return to mains.
- Load shedding can take place during the changeover to trip the unessential load when gen-set goes to island.
- Gen-set starts, the power is ramped-up, load is reconnected. The second gen-set is started if needed (more load requires more genset power).
- Automatic forward and reverse synchronisation with soft load ramp-up and ramp-down during changeover is available.
- Wide range of engine and generator protections, including vector shift protection are standard features.
- Automatic optimization of number of running sets according to load can be selected.
- Automatic equalization of running hours of particular engines is available.
- History file with performance log stored in IntelliGen^{NT} BaseBox allows easy backtracking and problem solving.

Scope of supply:

- 2x IntelliGen^{NT} BaseBox
- 2x IntelliVision 8
- 1x IntelliMains^{NT} BaseBox
- 3x IntelliVision 5
- 2x IG-AVRi
- 2x IG-AVRi-TRANS/LV
- 2x IGS-NT-LSM + PMS dongle



More loads – multiple grids



Description:

- In case of manipulation, the system switches from one branch to another by turning of the Master Selector Switch (MSS): BO MSS turn is used to turn the MSS.
- The mains voltage measurement, generator current measurement, MCB and GCB feedbacks, MCB and GCB control signals and Mains Failure (MF) signals (MainsPro outputs) are switched by the MSS, so that the system continuously “sees” only the selected branch.
- MCB and GCB are operated by pulse signal (GCB open/close, MCB close). The pulse is issued as a request for CB operation and terminated at the moment of corresponding feedback receipt.
- The MainsPro relays monitor mains on all 3 branches. In case of any MF, the gen-set is started.
- In case of MF on any branch, the proper MainsPro opens MCB, MSS switches to the failed branch and closes GCB.
- If a MF occurs on a different branch at the same moment, the controller finishes manipulation of GCB, MSS switches to a different branch and closes the other GCB.
- After an existing MF state terminates on any branch, the MSS turns to this branch, IntelliSys^{NTC} BaseBox reverse-synchronizes and closes MCB and opens GCB. Short-time parallel is allowed on the current branch.
- The MSS is blocked from moving away from a branch, where:
 - parallel operation is in effect
 - GCB open/close or MCB close signals are active
 - MF signal is in effect and GCB is open
- In case that all existing MF are solved and all GCB's are open, the gen-set stops.

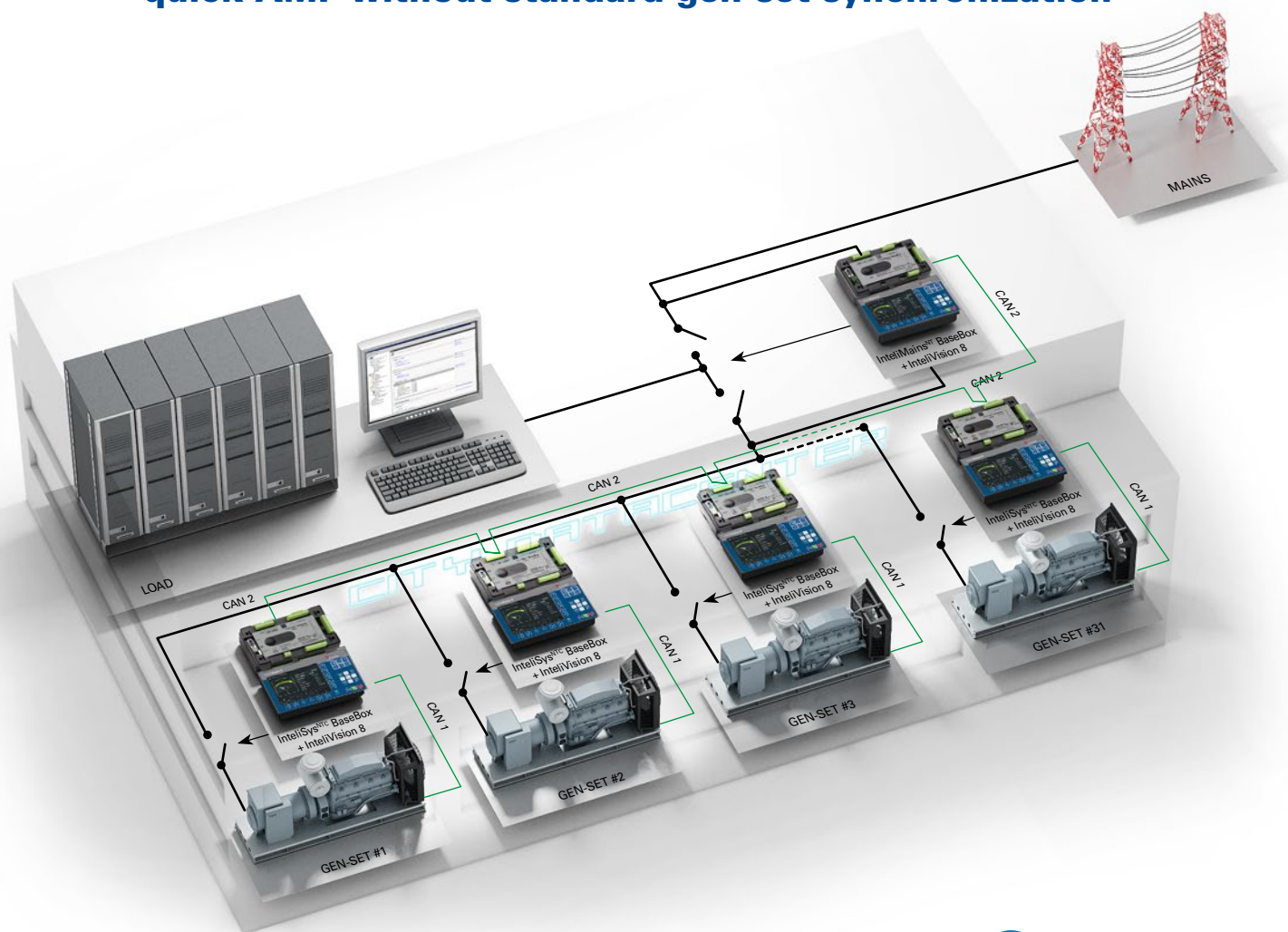
Scope of supply:

- | | | |
|--|-----------------------------------|-----------------------------------|
| ● 1x IntelliSys ^{NTC} BaseBox | ● 1x IG-AVRi | ● 1x Motorized rotary switch with |
| ● 1x IntelliVision 8 | ● 1x IG-AVRi-TRANS/LV | 3x 16 contacts (not delivered by |
| ● 3x MainsPro | ● 1x PLC (not delivered by ComAp) | ComAp) |



Start-up synchro gensets

– quick AMF without standard gen-set synchronization



Description:

- Application for faster start-up sequence of multiple generators.
- No need to synchronize generators by standard way and wait until all of them are synchronized on the same bus.
- Suitable for standby applications.
- Eliminates possible blackout time.
- Ideal for systems running on UPS.
- System available at full capacity in 8-10 seconds from start command.
- Start-up time remains constant even if the number of generators is increased to 10, 20 or 31.
- To avoid delaying availability of the system due to slow-starting generators or other problems, any engines that fail to reach running speed within a specified time are "rejected" from the scheme and, if able, are left to perform traditional synchronizing after the majority of sets have become available.
- Traditional synchronizing is available to allow for slow-starting generators.
- Automatic switching to traditional synchronizing in case insufficient sets are available to meet load's requirements.
- The soft magnetizing of feed transformers – solves the problem where grid supply is not capable of supplying the inrush and decreases the overall cost of the installation.

Controller options:

- IntelliGen^{NT} or IntelliSys^{NT} controllers with IGS-NT-SUS software with standard IntelliGen^{NT} or IntelliSys^{NT} firmware
 - IntelliGen^{NT} models: IntelliGen^{NTC} BaseBox, IntelliGen^{NT} BaseBox, IntelliGen^{NT}
 - IntelliSys^{NT} models: IntelliSys^{NTC} BaseBox, IntelliSys^{NT} BaseBox

Dongle options:

- IGS-NT-SUS-LSM+PMS dongle



Asynchronous generator control

– asynchronous generator for small CHP



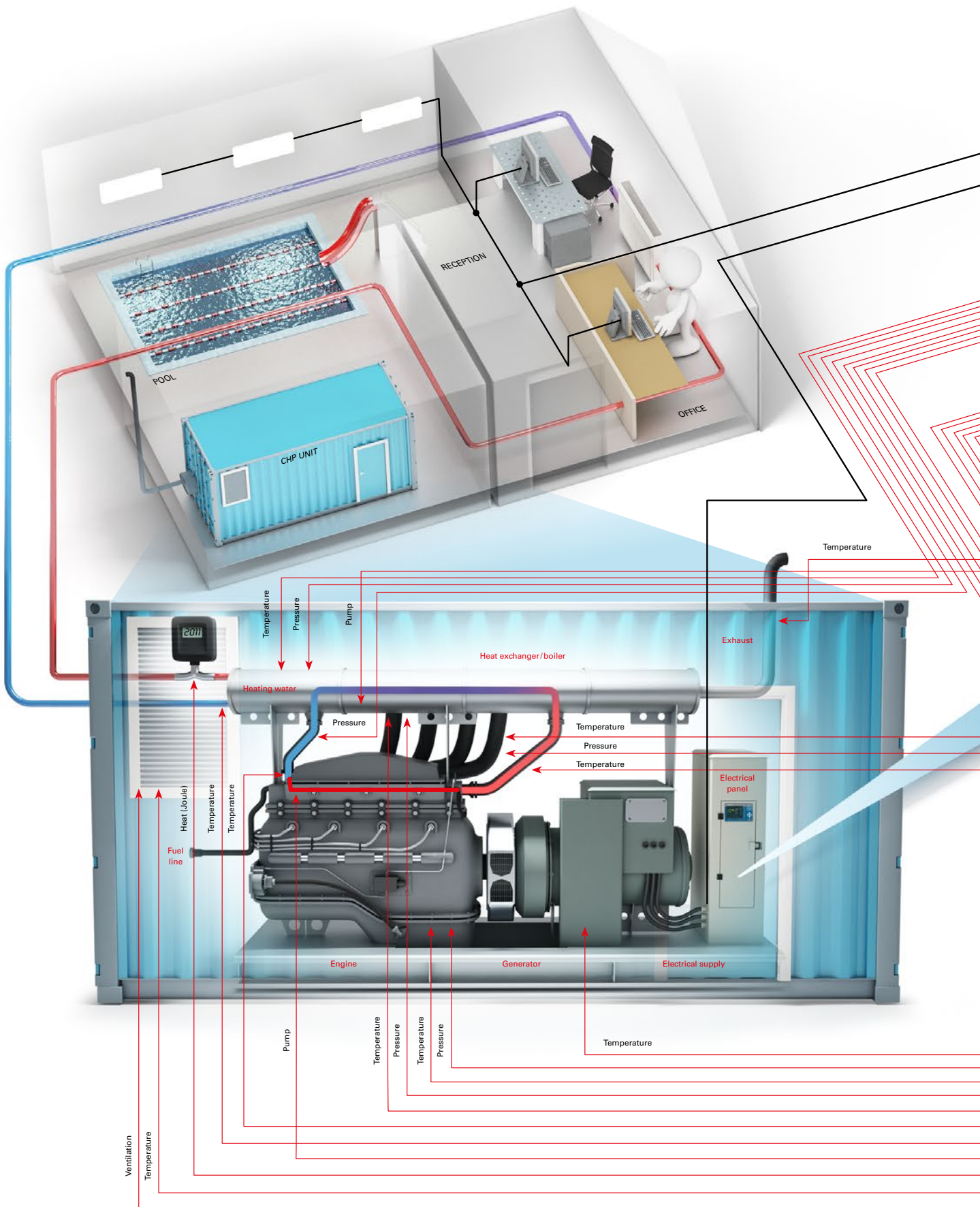
Description:

- Application for gen-set with asynchronous generator.
- Extend PLC Editor with blocks of regulators for control small CHP
- Controller can automatically starts the gen-set by schedule (according to the tariff zone).
- Gen-set with asynchronous generator is possible to run to the mains only.
- Controller provides all standard protections for gen-set with configuration options.
- Remote control and monitoring is available through WebSupervisor or IntelliMonitor.
- WebSupervisor iPhone App gives you direct access to your WebSupervisor account to monitor your asynchronous gen-set. Stay simply connected.
- CHP (combined heat and power) is the most efficient way of using fossil or renewable fuel, because heat from the engine is used for home heating and produced electrical energy is sold to the mains.

Controller options:

- IntelliGen^{NT} or IntelliSys^{NT} controllers with IGS-NT-Async software
 - IntelliGen^{NT} models: IntelliGen^{NTC} BaseBox, IntelliGen^{NT} BaseBox, IntelliGen^{NT}
 - IntelliSys^{NT} models: IntelliSys^{NTC} BaseBox, IntelliSys^{NT} BaseBox

Combined heat and power (CHP) – cogeneration





Description:

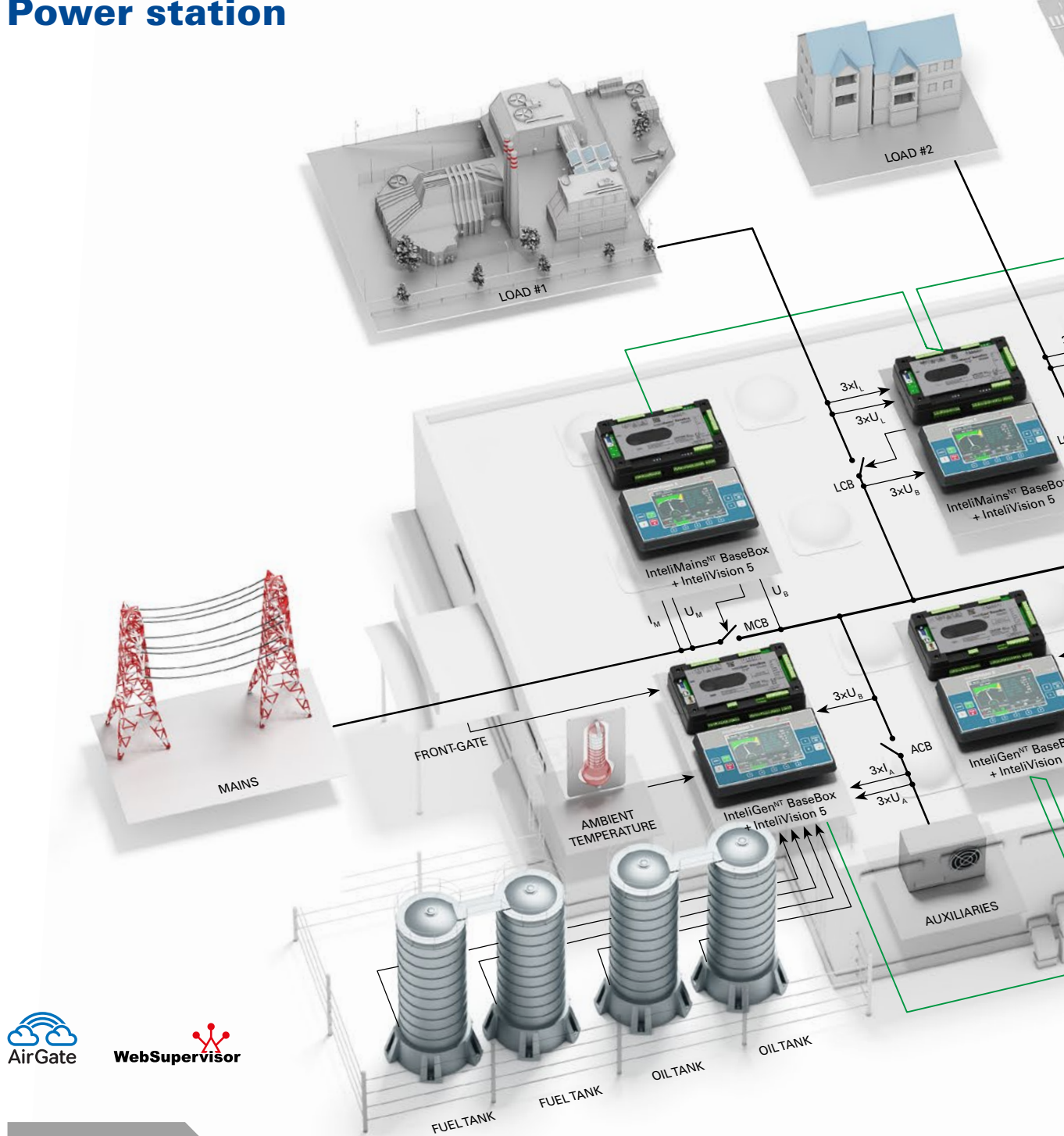
- CHP (also known as cogeneration) is the most efficient way of using fossil or renewable fuel.
- It provides output of power (3 phase electricity) and heat (hot water), which is recovered from the cooling system and flue gases.
- The overall power and heat consumption of the application can be covered by the CHP system. Export of energy or heat is also possible.
- All analog and binary signals both from engine and from auxiliary systems are measured by IntelliSys^{NTC} BaseBox and its accessory modules.
- Complete control of auxiliary technologies is done by built-in PLC module.
- All data measured from auxiliary equipment are stored in a history file.
- Remote control and monitoring is available.
- Only the most important analog inputs/outputs and binary inputs/outputs connections are drawn.

Scope of supply:

- | | |
|--|-----------------------|
| ● 1x IntelliSys ^{NTC} BaseBox | ● 1x I-AOUT8 |
| ● 1x IntelliVision 8 | ● 1x IG-AVRi |
| ● 1x IntelliVision 17Touch | ● 1x IG-AVRi-TRANS/LV |
| ● 1x Intelli IO8/8 | ● 1x IntelliPro |
| ● 2x IS-AIN8 | |

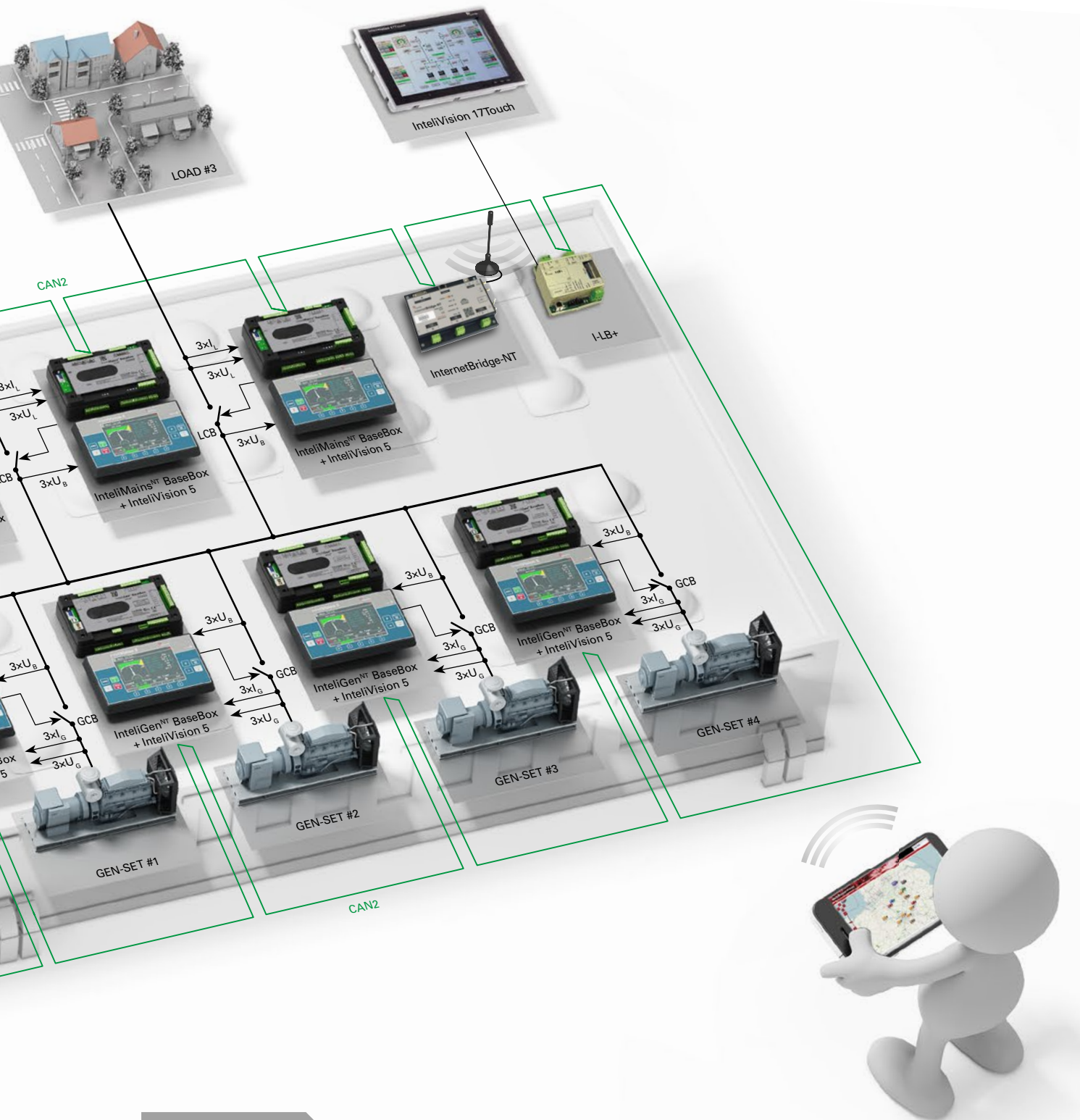


Power station



Description:

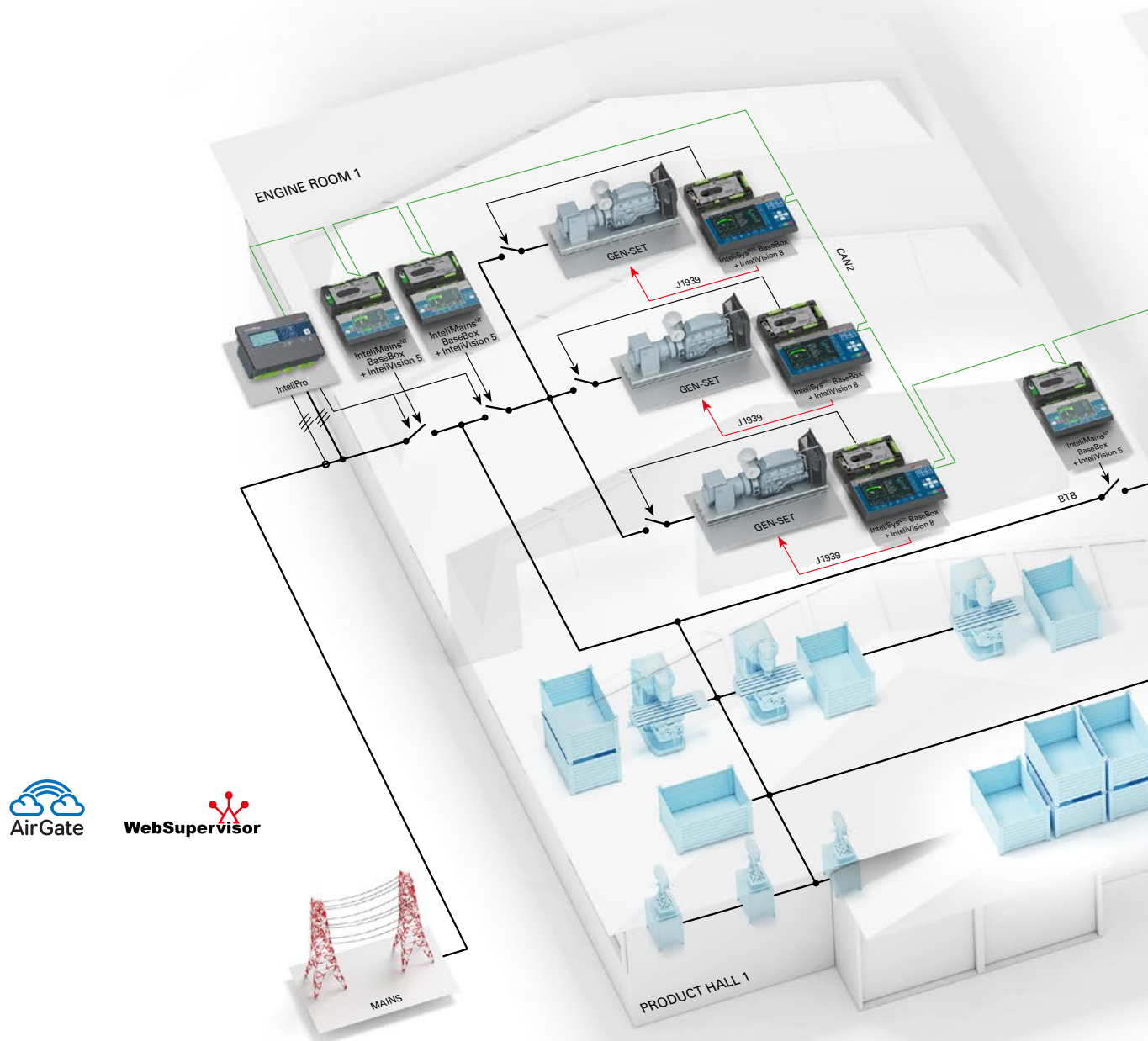
- Automatic start and stop of gen-sets is based on the gen-set Priority change provided by the controller equipped with IGS-NT-PSC software.
- Power Management for 16 different power bands allows increasing the efficiency of power station based on combination of engines of different size.
- Power Station Controller (PSC) ensures even more reliable solution for run hours equalization mode with up to 30 gensets and meet the highest criteria for run hours balancing and related maintenance afterwards.
- Auxiliary devices control like a complete fuel system control (two fuel pumps control build-in), fans, air-conditioning with defined functions or with extended programmable logic control.
- Master control of group of gensets and auxiliary devices with all important monitoring data.
- IntelliMonitor and WebSupervisor are used for remote monitoring and control.
- Alarm messaging via SMS or active e-mails introduces the comfortable daily solution.
- History file with performance log stored in the controller (it is possible to use IntelGen^{NT}, IntelGen^{NT} BaseBox, IntelGen^{NTC} BaseBox, IntelliSys^{NT} BaseBox or IntelliSys^{NTC} BaseBox).
- ComAp controllers' CAN bus compatibility allows the user to connect a Power Station unit into a new or existing installation to create a higher specified solution immediately.
- Maximize the power of AirGate technology by connecting through a GSM network.
- Complete power station solution provided in cooperation with IntelliMains^{NT} FDR application.



Scope of supply:

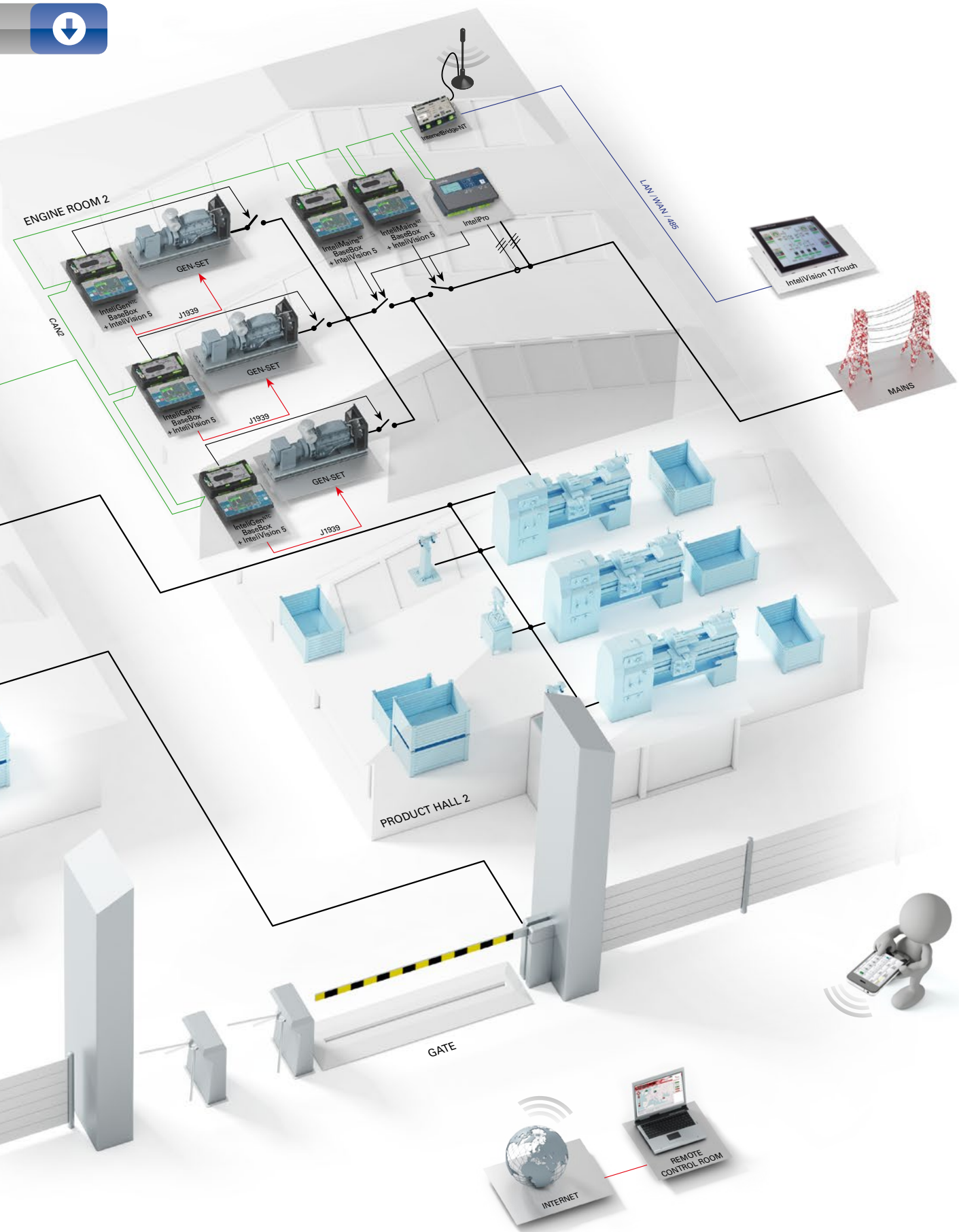
- InteliGen^{NT} or InteliSys^{NT} controllers with IGS-NT-PSC and gen-set control software
 - InteliGen^{NT} models: InteliGen^{NTC} BaseBox, InteliGen^{NT} BaseBox, InteliGen^{NT}
 - InteliSys^{NT} models: InteliSys^{NTC} BaseBox, InteliSys^{NT} BaseBox
- InteliMains^{NT} controllers with IM-NT-M(G)CB and IM-NT-FDR software (depending on application and used controller)
 - InteliMains^{NT} models: InteliMains^{NTC} BaseBox, InteliMains^{NT} BaseBox, InteliMains^{NT}
- Accessories:
 - Displays:
 - Color models: InteliVision 17Touch, InteliVision 8, InteliVision 5 RD, InteliVision 5
 - Monochrome models: IS-Display, IG-Display LT GC
 - Communication modules: InternetBridge-NT, I-LB+

Complex installation – multiple grids



Description:

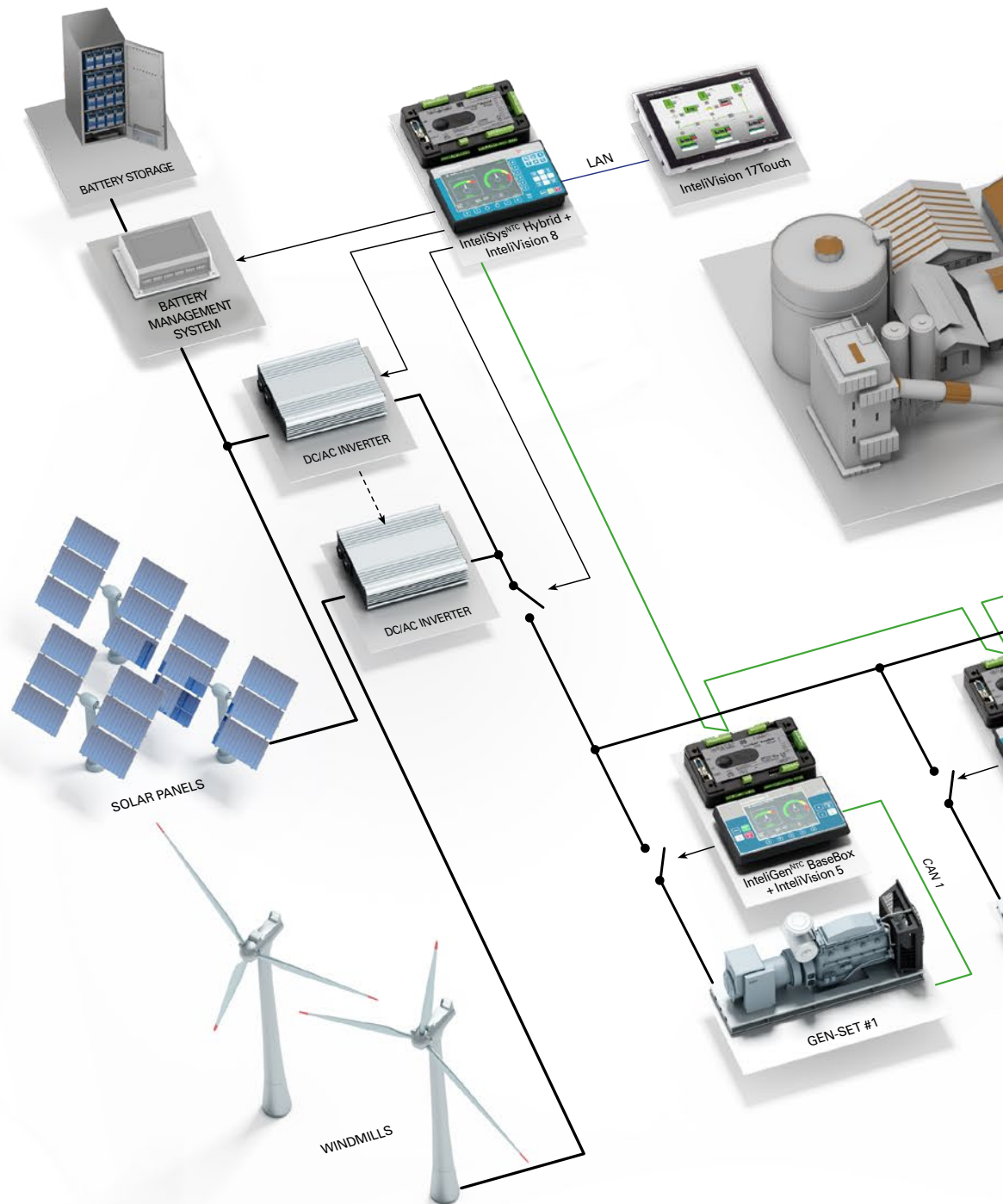
- Essential load is fed by two mains feeders during normal operation to achieve maximum reliability of the power delivery. Bus-tie breaker (BTB) is closed.
- The built-in PLC may contain a complex switching algorithm that determines which breakers are open and closed based on user requirements and current situation (gen-set availability, Mains status etc.).
- Reverse synchronizing on both feeders and on bus-tie breaker is accomplished by 5 IntelliMains^{NT} modules.
- Active and reactive load-sharing can operate in two modes:
 - Sharing the load between all running gen-sets – if BTB is closed
 - Sharing the load in two independent groups – if BTB is opened
- Automatic power dependant start/stop can operate in two modes as well:
 - Running on all gen-sets – if BTB is closed
 - Running in two independent groups – if BTB is opened
- All controllers are interconnected by one CAN bus all the time, disregarded if BTB is closed or open, no need for relays reconnecting the CAN bus.
- Complete system is remotely controlled and supervised from Control room connected via company LAN and InternetBridge-NT to all controllers.
- IntelliPro and IntelliMains^{NT}, both with their own integrated mains protections, offer users in combination the reassurance of two-level protection.
- IntelliMains^{NT} features numerous system control options in Parallel to Mains operation. This product offers Internal and External Baseload control with Export limitation, Internal and External Import/Export control and Load control based on measured system temperature.



Scope of supply:

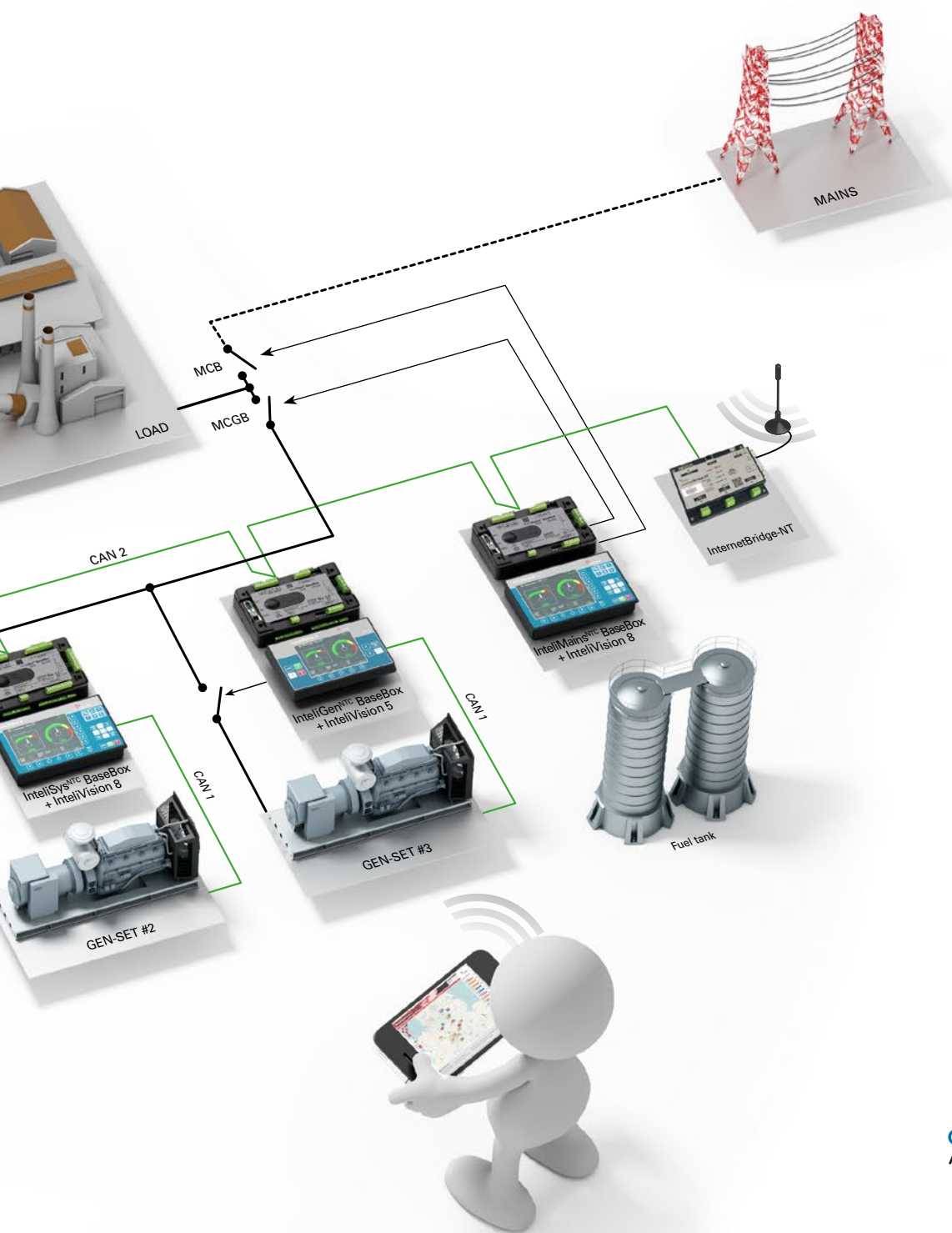
- 3x IntelliGen^{NTC} BaseBox
- 3x IntelliSys^{NTC} BaseBox
- 5x IntelliMains^{NT} BaseBox
- 2x IntelPro
- 8x IntelliVision 5
- 3x IntelliVision 8
- 1x IntelliVision 17Touch
- 1x InternetBridge-NT
- 6x IG-AVRi
- 6x IG-AVRi-TRANS/LV
- 6x IGS-NT-LSM+PMS dongle

Hybrid power plant



Description:

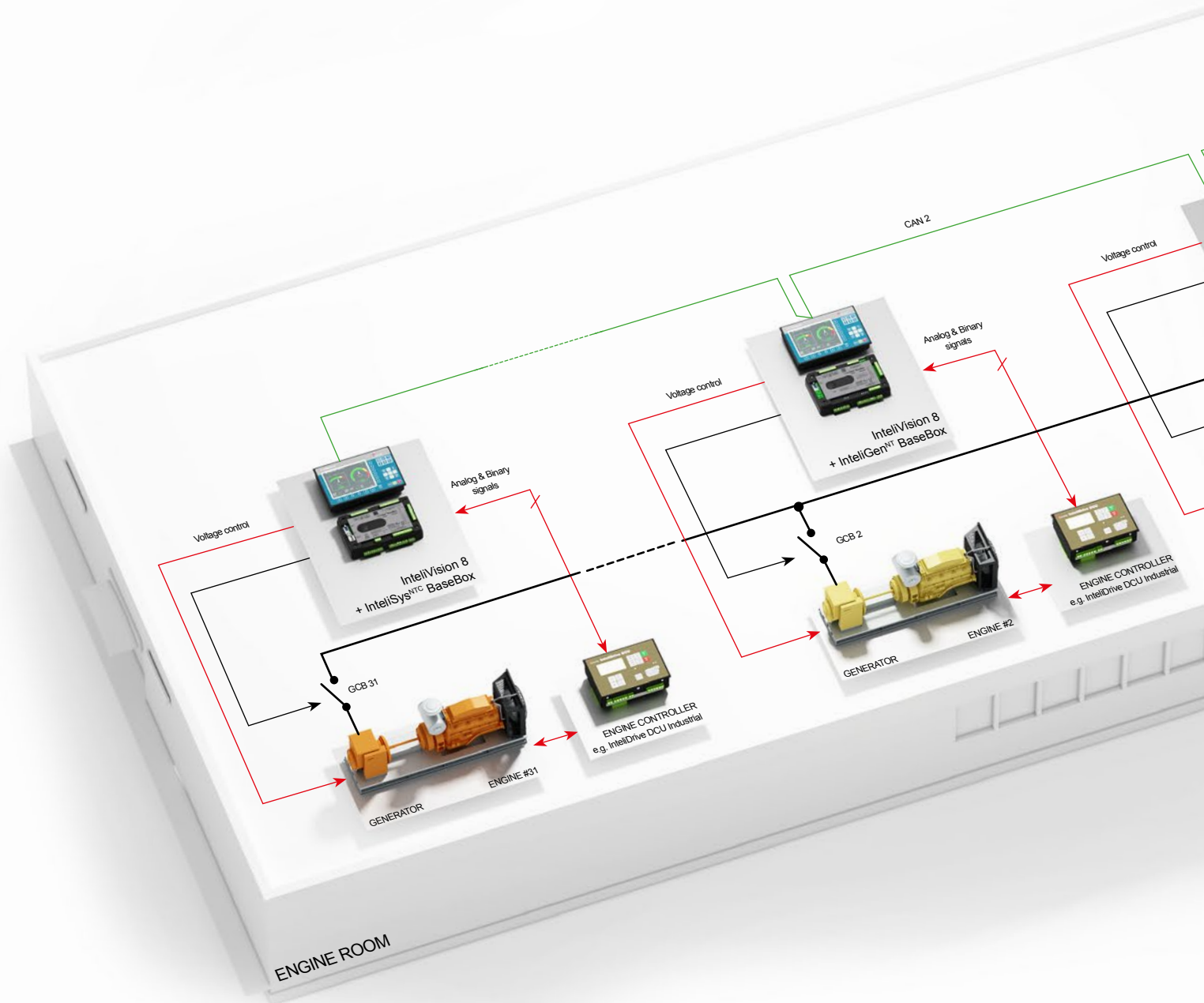
- Hybrid applications combine reciprocating gen-sets with renewable source of power. ComAp's Hybrid system continuously monitors data from all sources of energy including solar, wind or hydro and gen-sets.
- The ComAp controller automatically starts, synchronizes and loads the group of gen-sets to run smoothly alongside the renewable source.
- ComAp controllers also feature so called Dynamic Spinning reserve function. This allows to change the amount of gen-sets running according to the amount of power produced by renewables to ensure that the system can cover the drop in the renewable generator output.
- ComAp controllers can manage smooth operation of up to thirtytwo gen-sets to ensure smooth and reliable power supply.
- In case that there are gen-sets of different sizes, power outputs and different manufacturers, the Fuel Save mode will automatically choose the most efficient combination of gen-sets based on their size to save some extra fuel.
- IntelliSys^{NTC} Hybrid provides interface to frequency inverters. In case that gen-set runs under certain percentage of its nominal load the controller regulates the inverter output to prevent the engine from running underloaded.



Scope of supply:

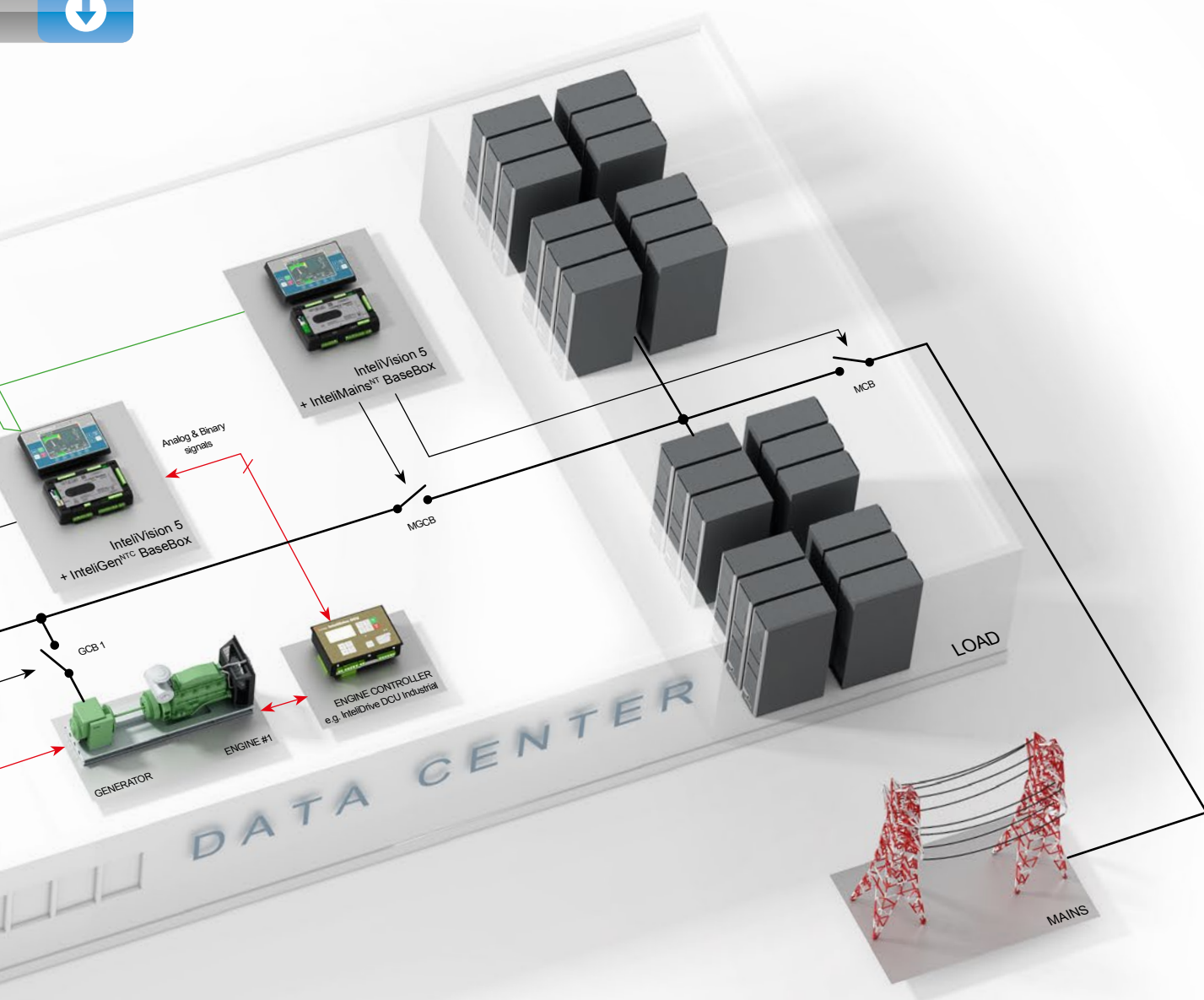
- 1x IntelSys^{NTC} Hybrid
- 1x IntelSys^{NTC} BaseBox
- 2x IntelGen^{NTC} BaseBox
- 1x IntelMains^{NTC} BaseBox
- 1x IntelVision 17Touch
- 2x IntelVision 5
- 3x IntelVision 8
- 1x InternetBridge-NT

Data Center Power Backup



Description:

- Typical use of GeCon software is on sites, where are several kinds of engines (various producers) and the customers need to have over all control off all gen-sets.
- Some engines have their own engine control unit (e. g. IntelliDrive DCU or PCC) and can not install standard IntelliGen^{NT} or IntelliSys^{NT} controller.
- At the engines with engines control unit (e. g. IntelliDrive DCU) is used IntelliGen^{NT} or IntelliSys^{NT} controller with software GeCon which causes possibility to connect this gen-set e.g. to the gen-sets with IntelliGen^{NT} or IntelliSys^{NT} controller with standard software or the next engines from different producers with GeCon controller.
- Generators are controlled by GeCon controllers in (MINT) configurations.
- With this we can control all gen-sets and use power management and all features of IntelliGen^{NT} or IntelliSys^{NT} controller.
- GeCon controllers have the following modes:
 - MAN-synchronizing and load-sharing is automatic; genset start/stop in manual
 - AUTO-complete automatic control
 - Power Management System continuously evaluated load reserve on the bus and control of all working gen-sets throughout installation.



Controller options:

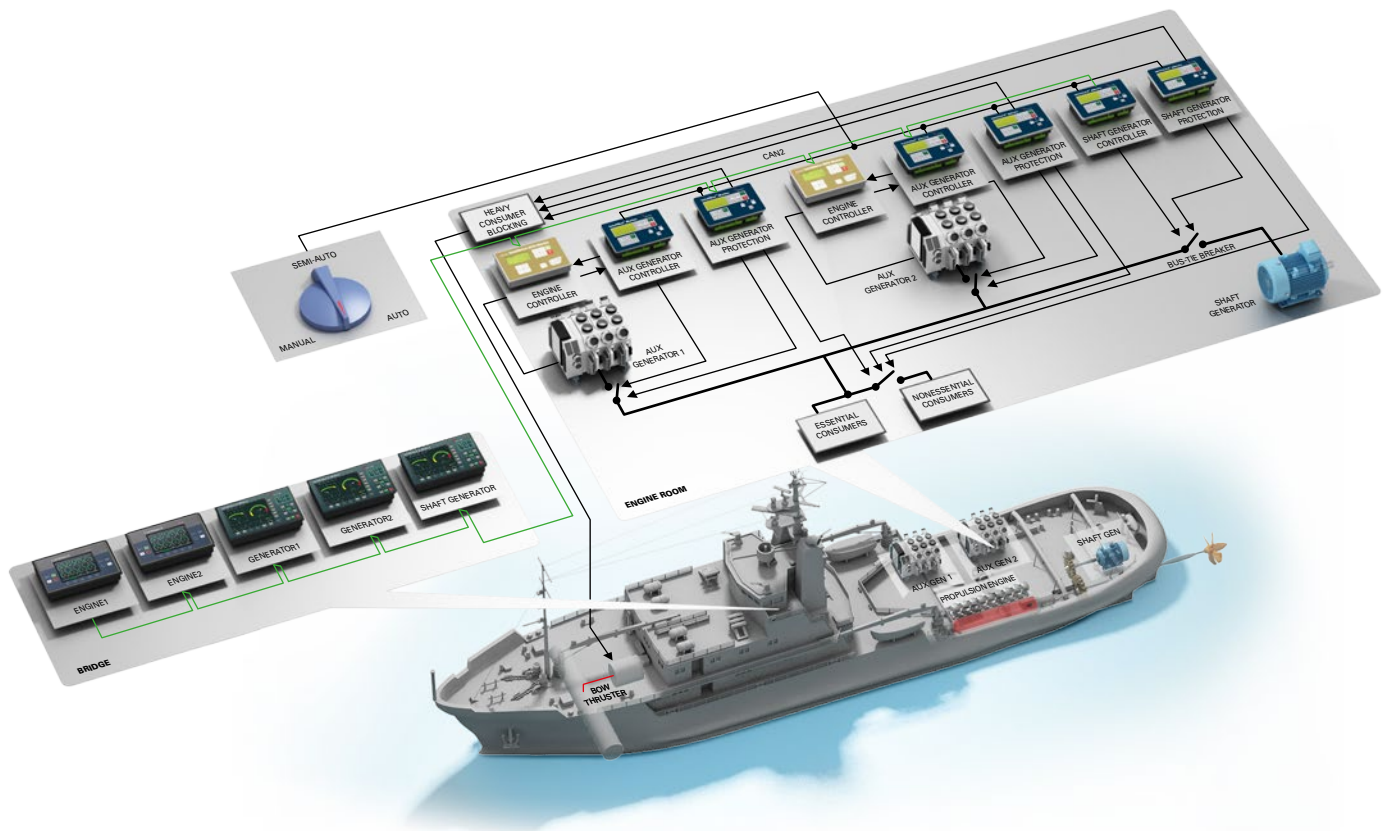
- IntelliGen^{NT} GeCon or IntelliSys^{NT} GeCon controllers with IGS-NT-GeCon-LandBased software
 - IntelliGen^{NT} GeCon models: IntelliGen^{NTC} BaseBox GeCon, IntelliGen^{NT} BaseBox GeCon, IntelliGen^{NT} GeCon
 - IntelliSys^{NT} GeCon models: IntelliSys^{NTC} BaseBox GeCon, IntelliSys^{NT} BaseBox GeCon

Upgrade kits:

- IGS-NT-LSM+PMS dongle or IGS-NT-GECON-LSM+PMS dongle for sw version IGS-NT-GeCon-Marine 3.0 and higher or IGS-NT-GeCon-LandBased 3.0 and higher
 - Load Sharing and Power Management for MINT and Combi applications
- IGS-NT-GECON-LSM+PMS dongle for sw version IGS-NT-GeCon 2.1 and lower
 - Load Sharing and Power Management for MINT and Combi application
- IGS-NT-GECON-PCM dongle for sw version IGS-NT-GeCon 2.1 and lower
 - Enables GeCon sw to run on the controller single parallel with mains in SPI, SPtM and PROT(for marine version only) applications



Ship power management system



Description:

- Two auxiliary generators and one shaft generator deliver electricity for systems of the ship. Generators are controlled by GeCon software in MINT configurations.
- Controllers can work in three basic operational modes:
 - MANUAL – controller does not control the generator, options switch off/on of protections
 - SEMI-AUTO – synchronizing and load-sharing is automatic; genset start/stop and load transfer between aux and shaft generators in manual
 - AUTO – complete automatic control
- Power management system continuously evaluates load reserve on the bus and blocks start of the bow thruster if the load reserve is insufficient.
- Load shedding automatically trips the non-essential systems, if the power system is overloaded.
- Load shedding can control up to 10 independent circuits of non-essential systems.
- Freely programmable built-in PLC functions are used to accomplish load transfer between shaft and auxiliary generators.
- Marine approved by DNV, GL, Lloyd's Register and CRS.

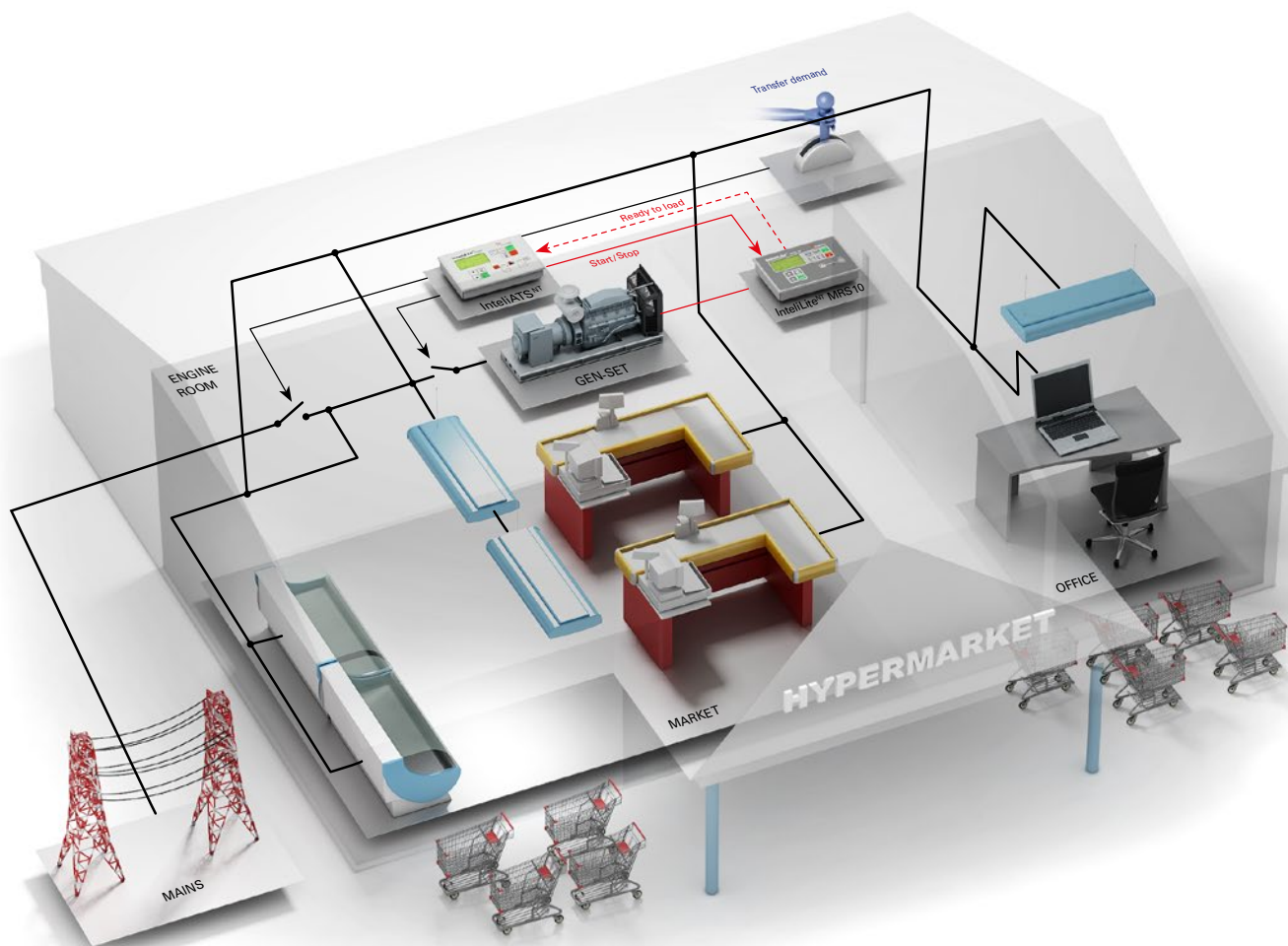
Scope of supply:

- 6x IntelliGen^{NT} Marine GeCon
- 2x IntelliDrive DCU Marine
- 3x IntelliVision 8 Marine
- 2x IntelliVision 5 CAN Backlit
- 6x IG-AVRi
- 6x IG-AVRi-TRANS/LV



Open/delayed transition

– auto/manual transfer



Description:

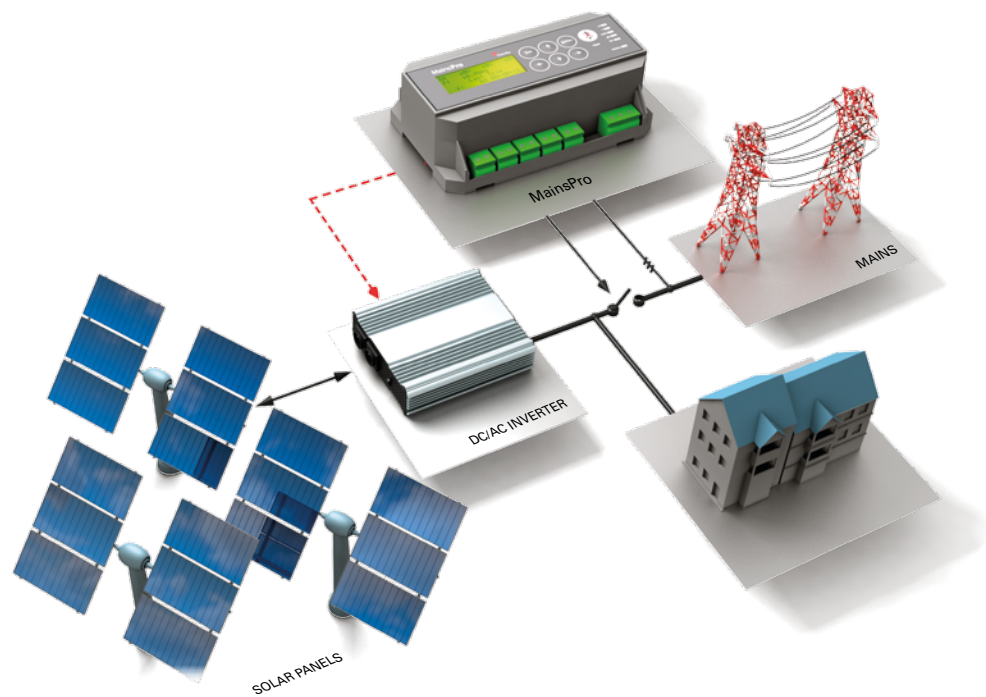
- Stand-by gen-set.
- InteliATS^{NT} continuously monitors mains supply for under voltage, over voltage, under frequency, over frequency and voltage unbalance. In the case of mains failure it sends a remote start command to the standby gen-set.
- InteliATS^{NT} waits for "Ready To Load" signal or standby gen-set voltage – configurable – and switches load to the standby generator.
- After the mains returns the InteliATS^{NT} switches load back to mains and sends remote stop command to the standby gen-set.
- Different delay intervals can be set for individual changeover phases.
- The changeover can take place also on explicit demand, not only after mains failure.
- ATS function works with backup battery or in reduced mode without backup battery.

Scope of supply:

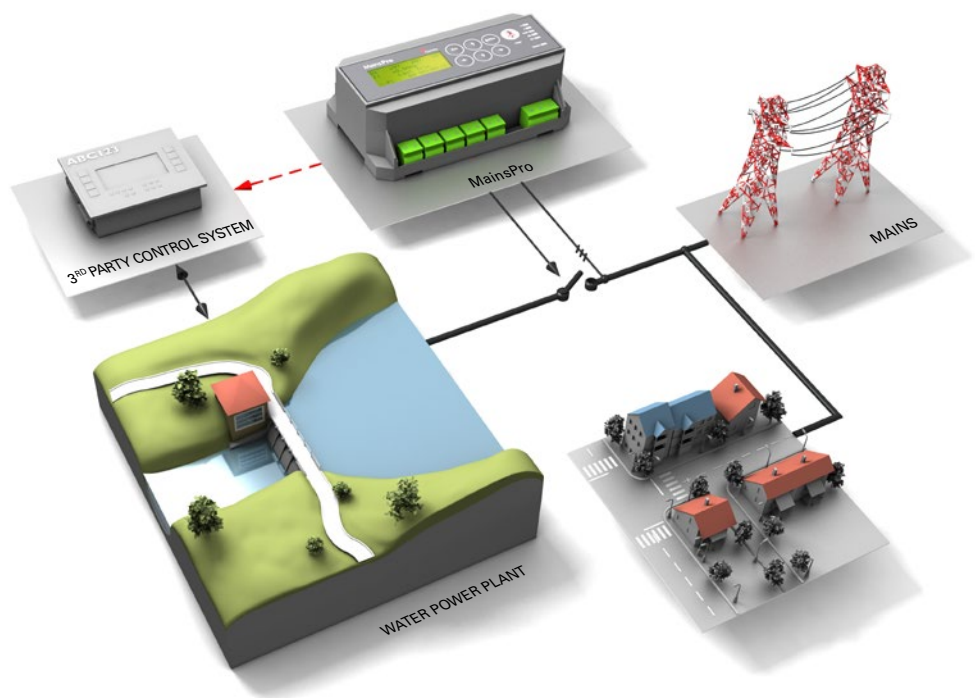
- 1x InteliATS^{NT} STD
- 1x arbitrary gen-set controller (e.g. InteliLite^{NT} MRS 10) or key start box



Solar



Water



Description:

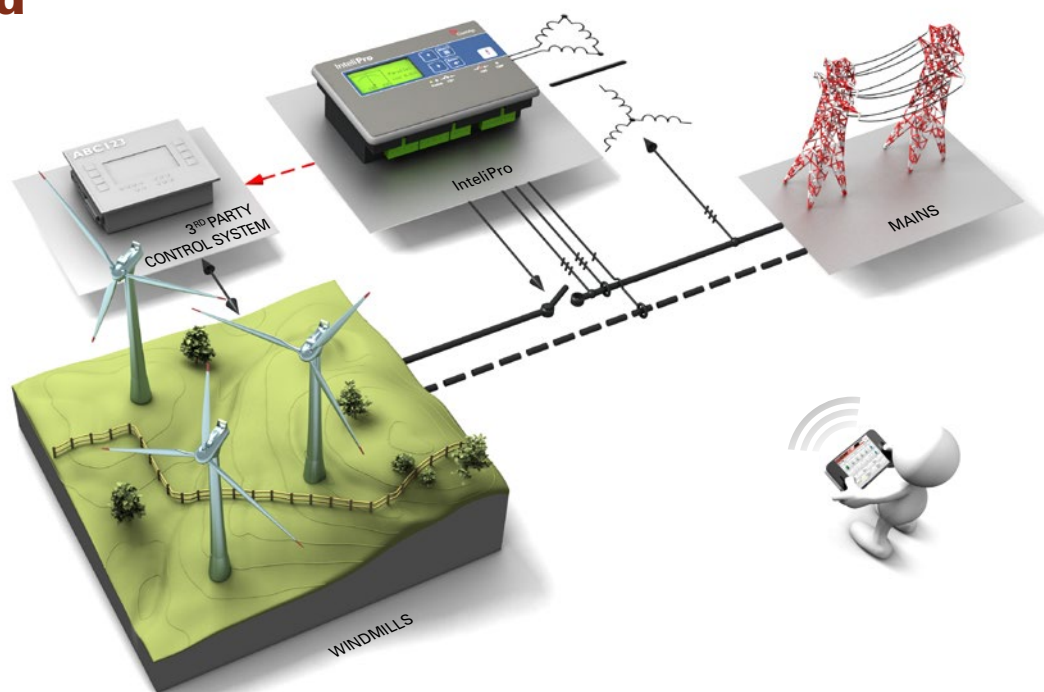
- For higher operation reliability and safety, parallel-to-mains applications should be equipped with mains protections.
- Mains protection prevents the mains as well as the generator from damage due to unexpected disturbances.
- ComAp protection relays are suitable for any generator sets, renewable source of energy or combined heat and power application.
- MainsPro provides adjustable two level voltage, frequency and loss of mains protection.
- ComAp mains protections are precise and effective protection relays with user-friendly interface and intuitive operation.

Scope of supply:

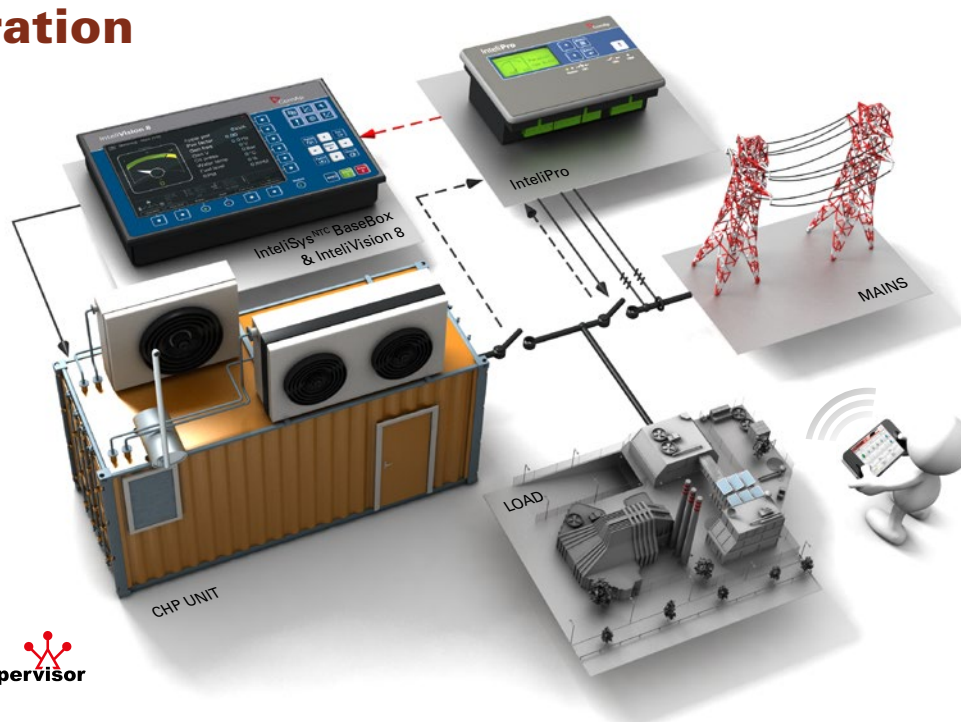
- 1x MainsPro (it is possible to use also IntelliPro)



Wind



Cogeneration



Description:

- On more complex applications requiring data exchange or remote access IntelliPro mains protection is recommended.
- IntelliPro is highly flexible protection relay with wide range of adjustable protection functions according to the site requirements.
- IntelliPro provides adjustable two level voltage and frequency protection, current measurement, loss of mains protection, earth fault current, neutral voltage displacement, etc.
- Advanced protection relay supporting plug-in-module concept offering variety of means of communication.

Scope of supply:

- 1x IntelliPro



Pump system



Description:

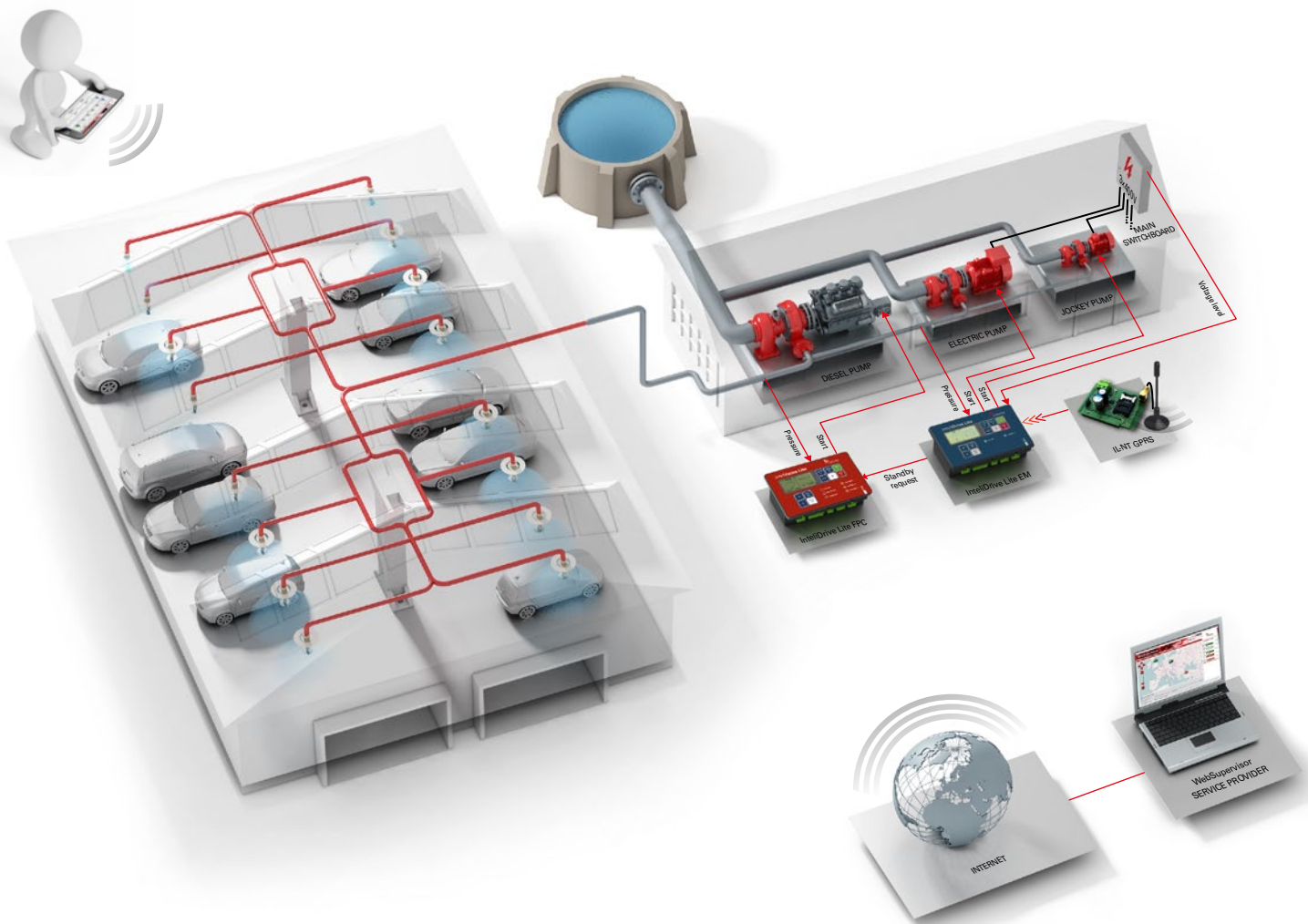
- IntelliDrive Nano WP makes complete control, monitoring and protection of diesel engine.
- The controller:
 - continuously monitors the tank fluid level
 - automatically starts the engine in case of low level
 - ramps the engine speed up to full power
 - automatically ramps the engine speed down and stops the engine in case of high level
- The J1939-CAN interface simplify wiring to the engine.

Scope of supply:

- 1x IntelliDrive Nano WP



Firepumps



Description:

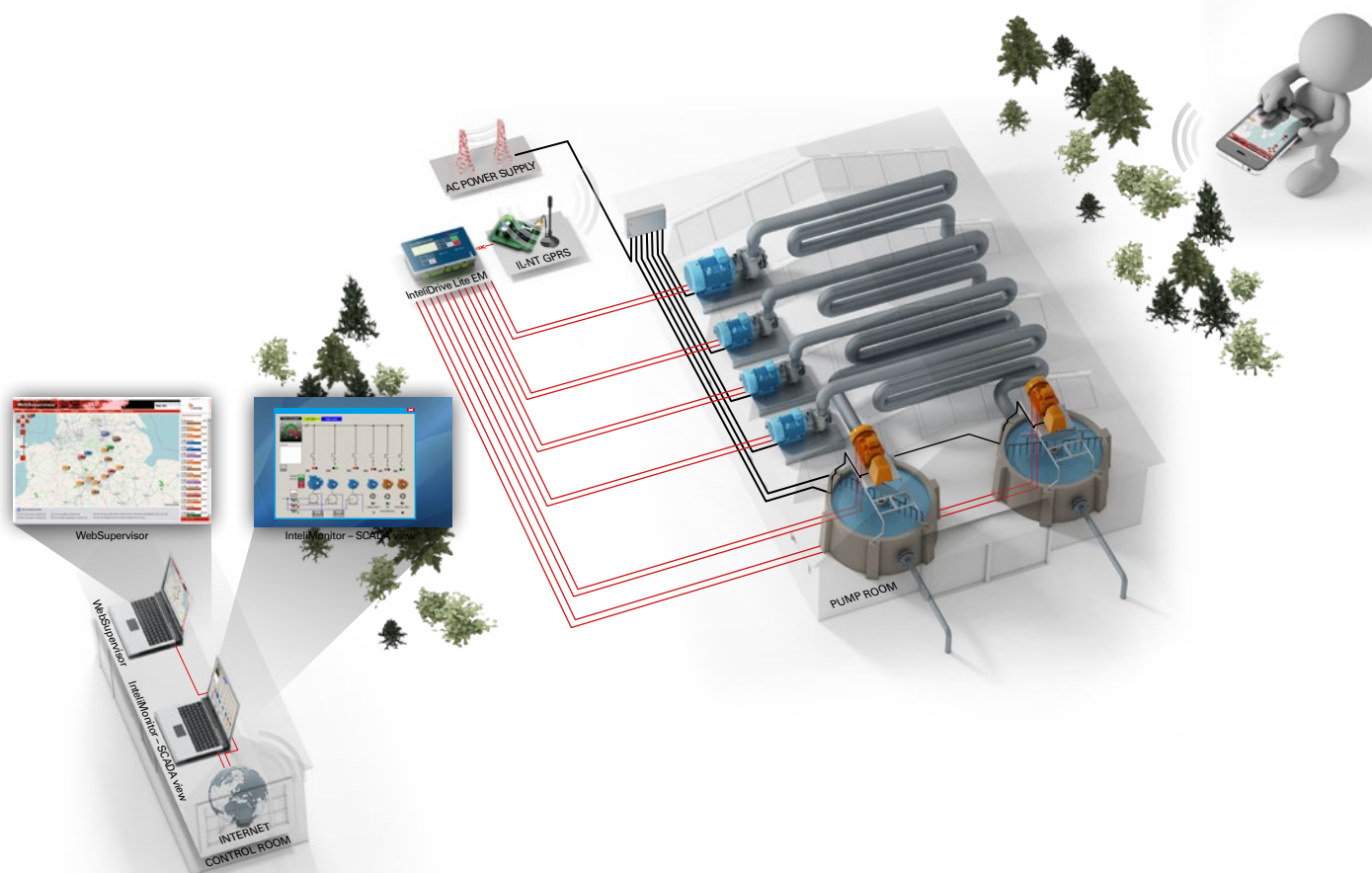
- Fire pump system is driven by combustion engine or by electric motor with combustion engine.
- Function of the controller is based on NFPA 20 standard.
- IntelliDrive Lite FPC is able to make complete control, monitoring and protection of engine in manual mode and control and monitoring in automatic mode.
- IntelliDrive Lite EM is able to make complete control, monitoring and protection of motor and control and monitoring in automatic mode.
- Depend on the smoke sensor or on the sprinkler system pressure is started combustion engine or electric motor.
- The controller allows regular testing of system.
- Firmware version of IntelliDrive Lite FPC enables to control complete system with diesel, electric and jockey pump in one.
- Possibility of central supervision via remote control.
- Support AirGate, WebSupervisor, Web server, ECU etc.

Scope of supply:

- 1x IntelliDrive Lite FPC
- 1x IntelliDrive Lite EM
- 1x IL-NT GPRS



Pump system with Electric motor



Description:

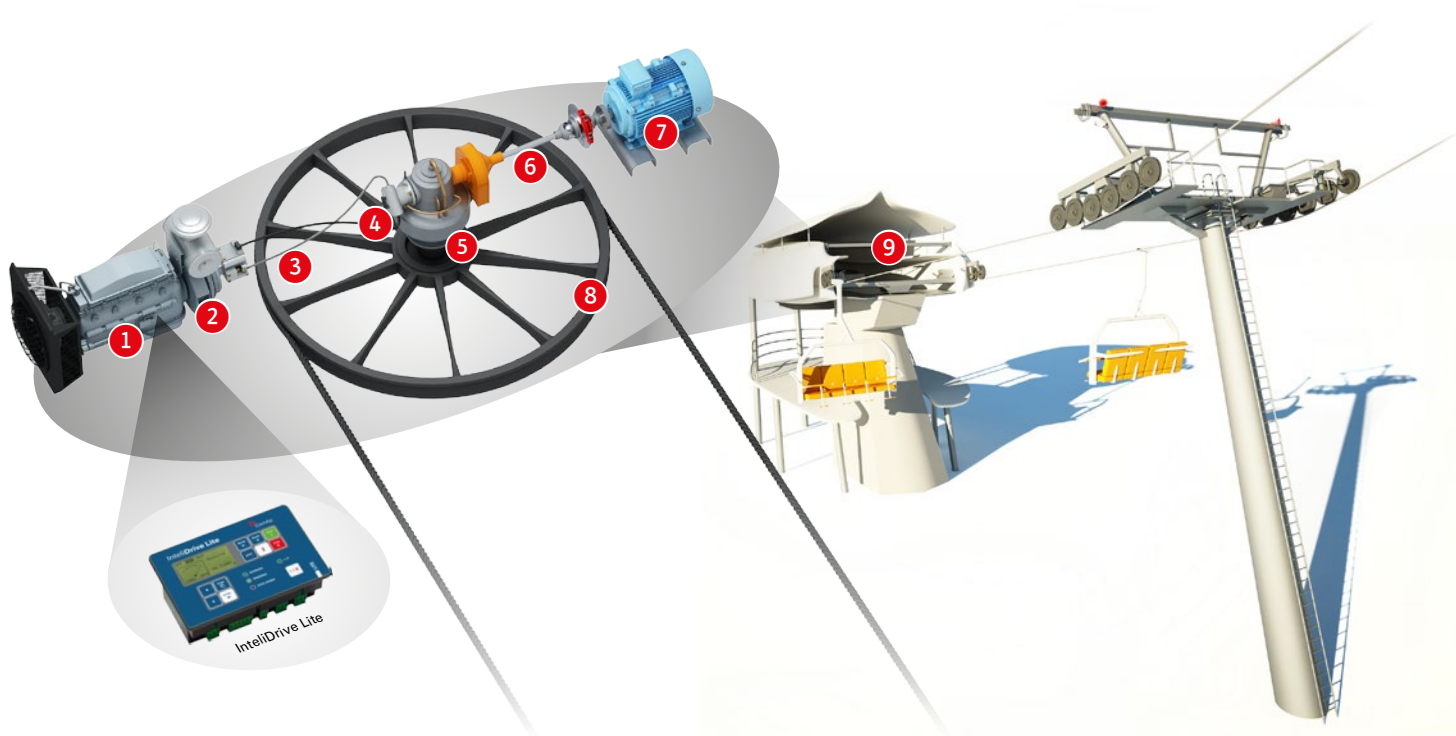
- Pump system is driven by electric motors.
- IntelliDrive Lite EM makes complete control and monitoring of the motors.
- The arigators are mixing injected chemical substance for purification of water. The arigators are switched from control room by IntelliDrive Lite EM controller and its binary outputs. Can be affected by timers adjustment.
- Depends on the pressure in the pipe system, which is measured by sensors through IntelliDrive Lite EM and displayed in IntelliMonitor SCADA system, are started centrifugal pumps. Centrifugal pumps with electric motors are used for distribution of water in and out of system.
- This application of water purification system can be controlled by six IntelliDrive Lite EM controllers for full protection of each electric motor and with variable ways of starting or by one IntelliDrive Lite EM controller with full protection system only for the main electric motor and with limited protection for the rest of electric motors, in this case, up to six electric motors can be started directly.

Scope of supply:

- 1x (up to 6) – IntelliDrive Lite EM
- 1x (up to 6) – IL-NT GPRS



Emergency drive for a sky lift



- 1 Diesel Engine
- 2 Hydraulic Pump
- 3 High Pressure Hoses
- 4 Hydraulic Motor
- 5 Reducer
- 6 Shaft with Disc-brake
- 7 Electric Engine
- 8 Driven Bullwheel
- 9 Drive Station

Description:

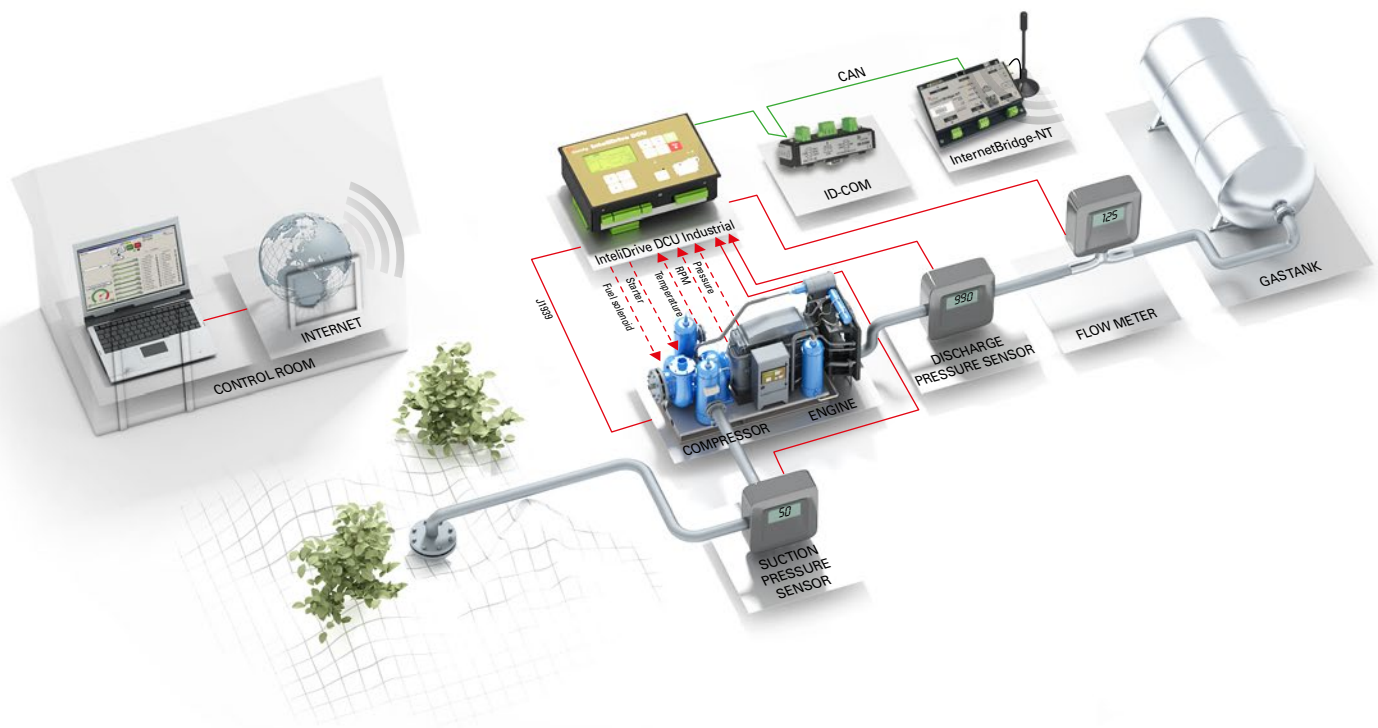
- The drive station of the chairlift is normally geared by a big electric motor with frequency converter by means of a short shaft and a big reducer.
- Diesel engine is used as an emergency drive in case of mains failure. It drives the lift via an engine-mounted hydraulic pump and hydraulic motor on the reducer.
- Engine is controlled and protected by IntelliDrive Lite, which communicates with engine's electronic injection control unit via CAN communication bus.

Scope of supply:

- 1x IntelliDrive Lite



Gas compressor



Description:

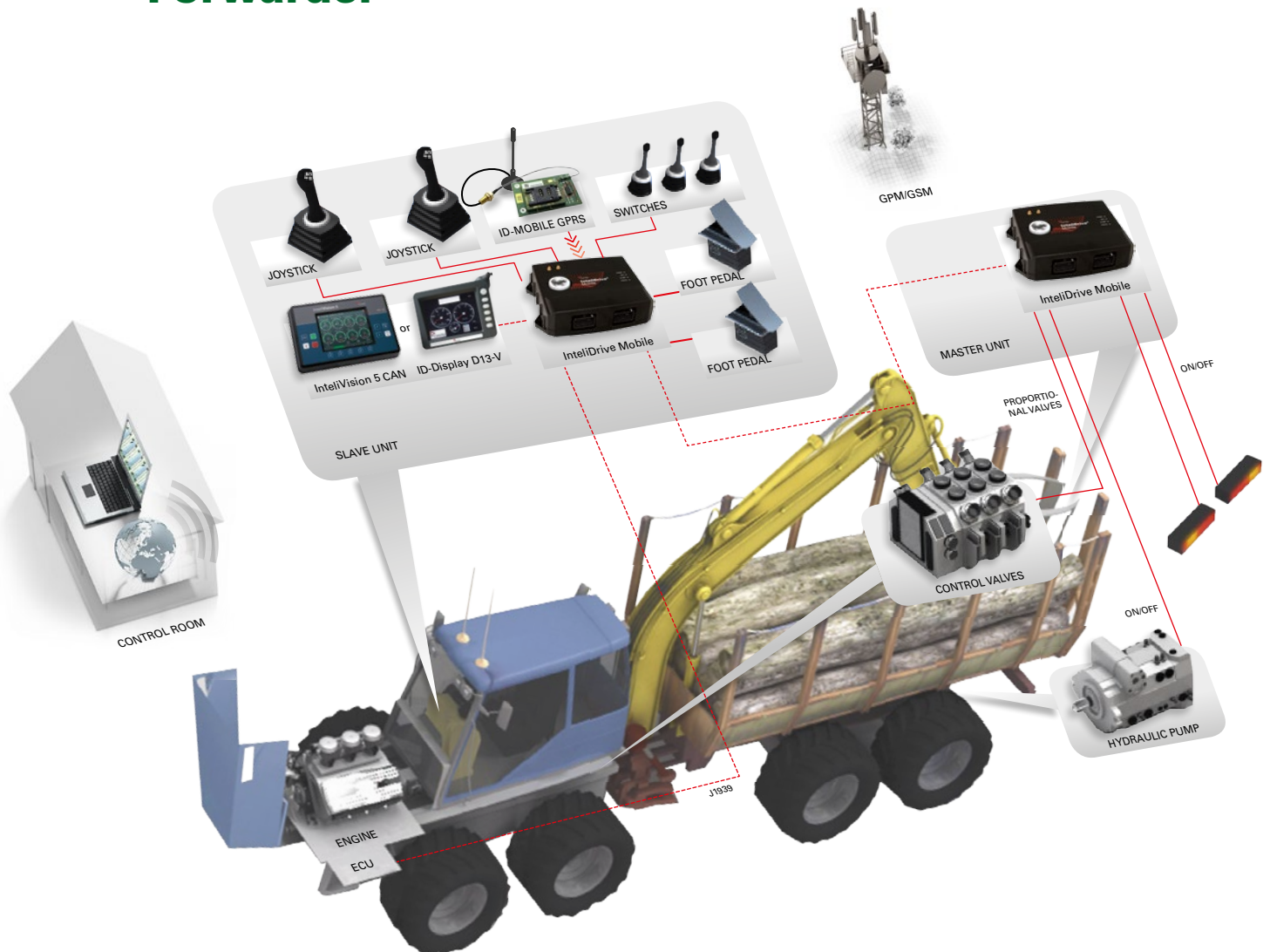
- Gas compressor is driven by a combustion engine.
- IntelliDrive DCU Industrial makes complete control, monitoring and protection of the engine and compressor.
- Sophisticated control algorithm using build-in PLC modules accomplishes optimal running conditions for the compressor.
- Speed of the engine is determined according to the suction and discharge pressures of the compressor.
- Additional unload and by-pass valves are controlled by IntelliDrive DCU Industrial in dependence on both suction and discharge pressures.

Scope of supply:

- 1x IntelliDrive DCU Industrial
- 1x InternetBridge-NT
- 1x ID-COM
- 1x ID-SCM



Forwarder



Description:

- Forwarder application – where electronic engine drives hydraulic pump and produces high-pressure oil for driving manipulator.
- Two IntelliDrive Mobile controllers are utilized in the application. The first one – Slave unit located in the driver's cabin receives commands from the driver via joysticks, foot pedals and various switches. Large color screen together with a few pilot lights gives complete information and machine status. The second IntelliDrive Mobile – Master unit located on the machine frame controls and monitors the engine and hydraulic control valves.
- Communication between the two IntelliDrive Mobile controllers and the on-board color screen is via CAN line. This makes the system wiring and integration very simple.
- All values, warnings and fault codes from the engine are displayed on the on-board color screen.
- GPS module allows geofencing function – protecting machine against the stealing or unauthorized use. SMS or e-mail warning is sent in such case.
- GPRS Module allows monitoring machine activities or status of vehicle.

Scope of supply:

- 1x IntelliDrive Mobile (Master unit)
- 1x IntelliDrive Mobile (Slave unit)
- 1x IntelliVision 5 CAN or ID-Display D13-V
- 1x ID-Mobile GPRS
- 1x GPRS/GPS Antenna
- Customized Harness



Dump Truck

- Data Logging



GPS

Description:

- Mining Dump Truck uses IntelliDrive Mobile Logger for complete monitoring and data logging of the vehicle multi-controls system.
- IntelliDrive Mobile Logger is designed for harsh environment meeting IP67 protection. The integrated control unit and harnesses concept makes the installation and production more simpler (no additional switchboard is needed).
- Required data from several control units (Engine control unit, Transmission control unit, Vehicle system unit and others) are via CAN bus and with analog and binary inputs collected and recorded in IntelliDrive Mobile Logger unit. There can be up to 220,000 events recorded which enables to check recorded values months backward.
- ID-Mobile GPRS module makes possible remote connection to the unit via AirGate. Combination with ID-Mobile GPS module allows features related to a location of the machine (position, Geofencing etc.).

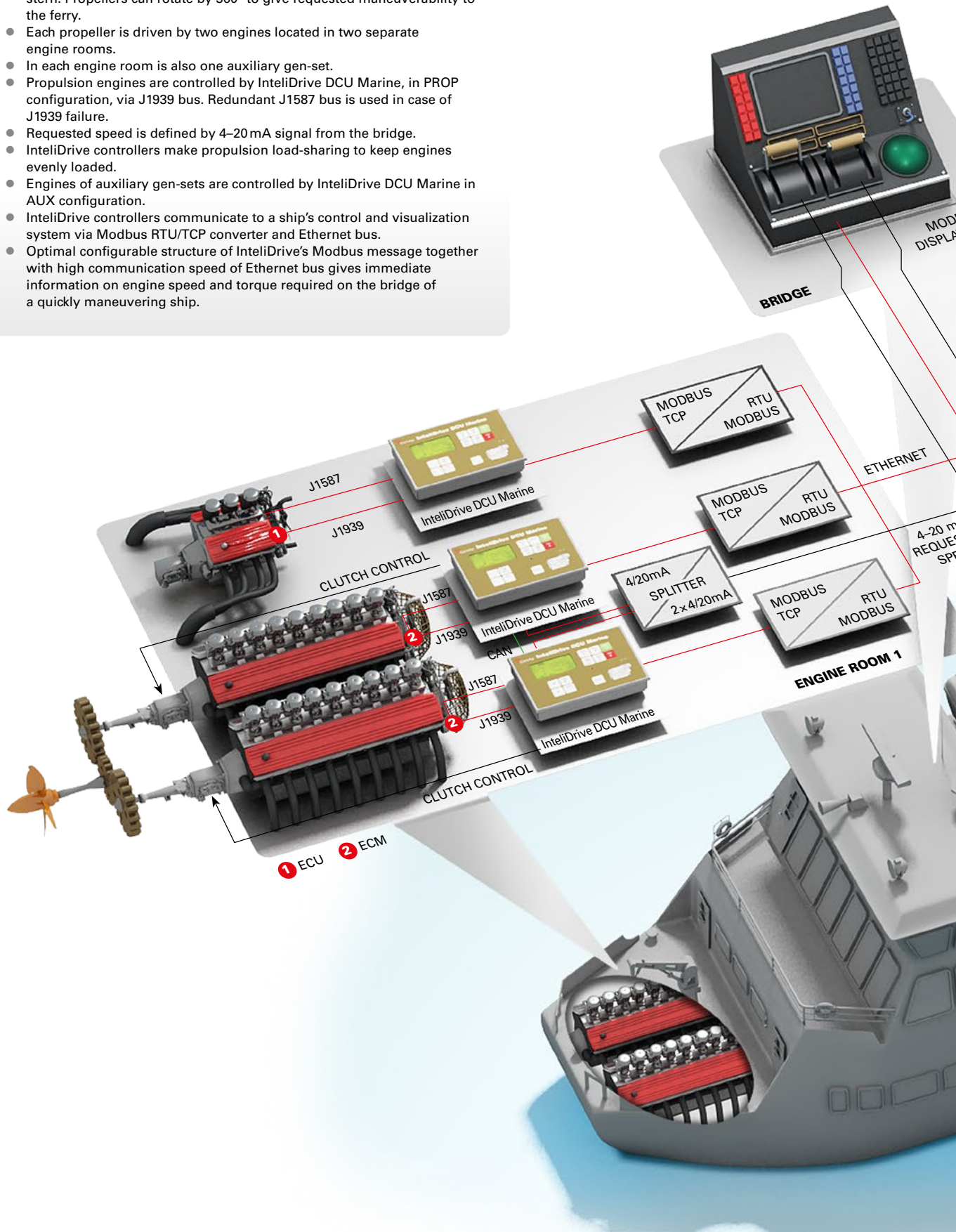
Scope of supply:

- 1x IntelliDrive Mobile Logger
- 1x ID-Mobile Logger Harness
- 1x ID-Mobile GPS
- 1x GPRS/GPS Antenna
- 1x IntelliVision 5 CAN or IntelliVision 8

Ship control system

Description:

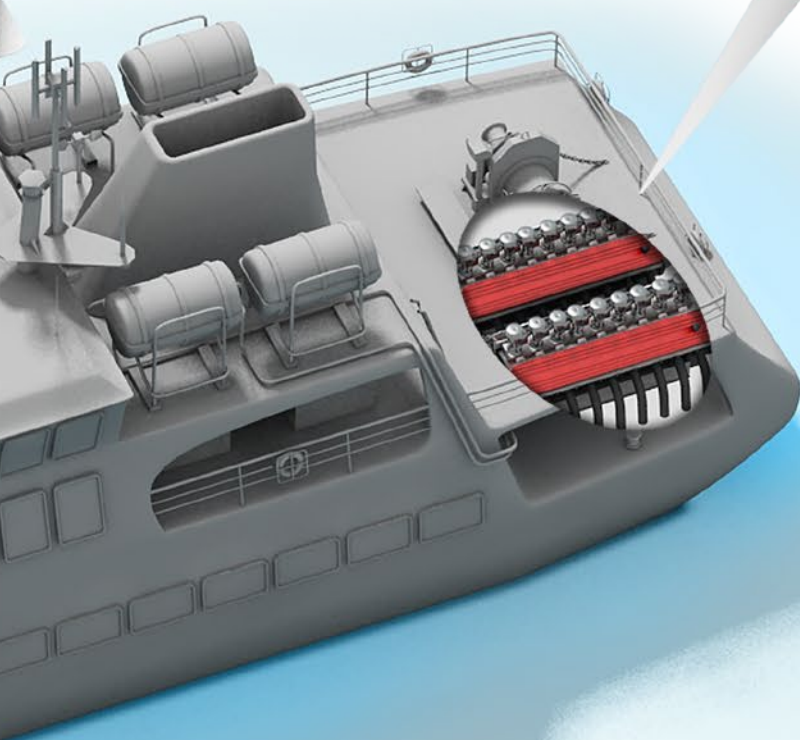
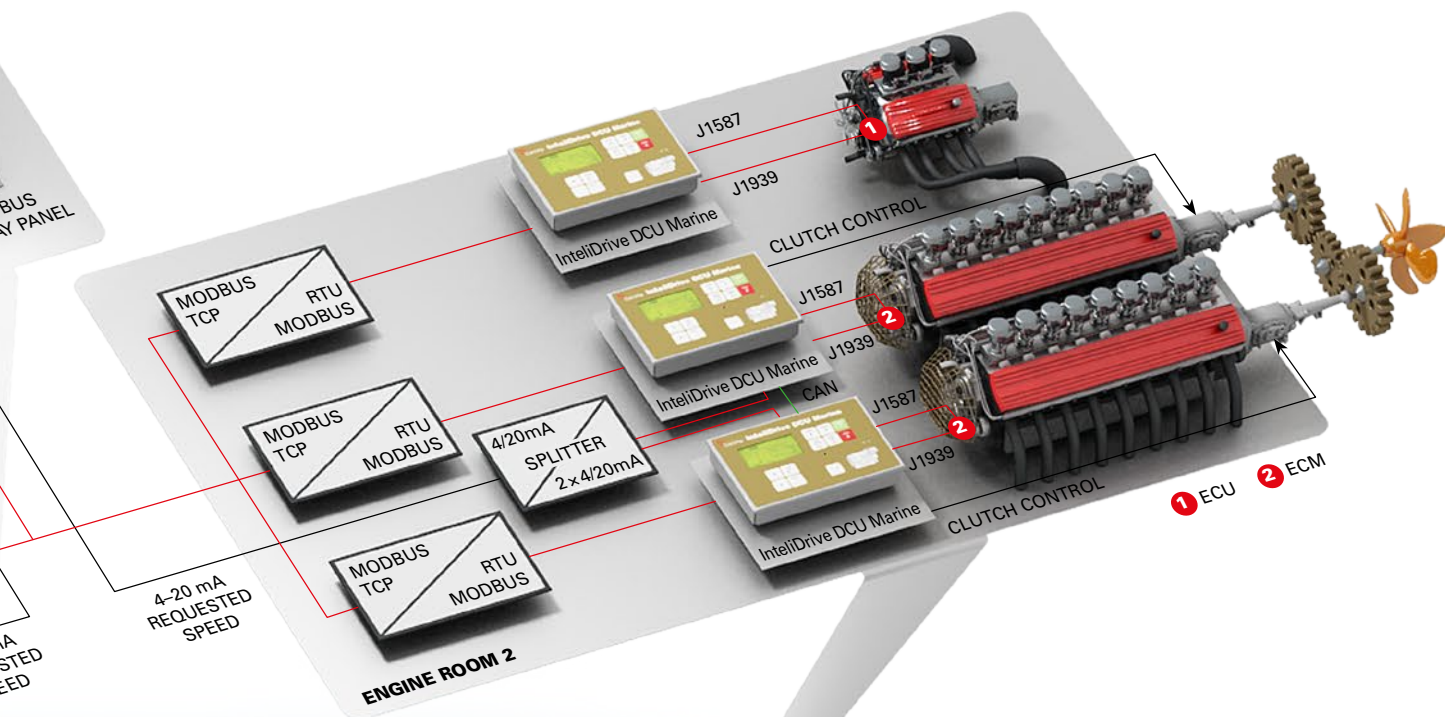
- Small ferries typically feature two propellers, one in bow and one in stern. Propellers can rotate by 360° to give requested maneuverability to the ferry.
- Each propeller is driven by two engines located in two separate engine rooms.
- In each engine room is also one auxiliary gen-set.
- Propulsion engines are controlled by IntelliDrive DCU Marine, in PROP configuration, via J1939 bus. Redundant J1587 bus is used in case of J1939 failure.
- Requested speed is defined by 4–20mA signal from the bridge.
- IntelliDrive controllers make propulsion load-sharing to keep engines evenly loaded.
- Engines of auxiliary gen-sets are controlled by IntelliDrive DCU Marine in AUX configuration.
- IntelliDrive controllers communicate to a ship's control and visualization system via Modbus RTU/TCP converter and Ethernet bus.
- Optimal configurable structure of IntelliDrive's Modbus message together with high communication speed of Ethernet bus gives immediate information on engine speed and torque required on the bridge of a quickly maneuvering ship.





Scope of supply:

- 6x IntelliDrive DCU Marine
- 6x ID-RPU
- 4x ID-COM
- 6x Modbus RTU/TCP converter (not delivered by ComAp)

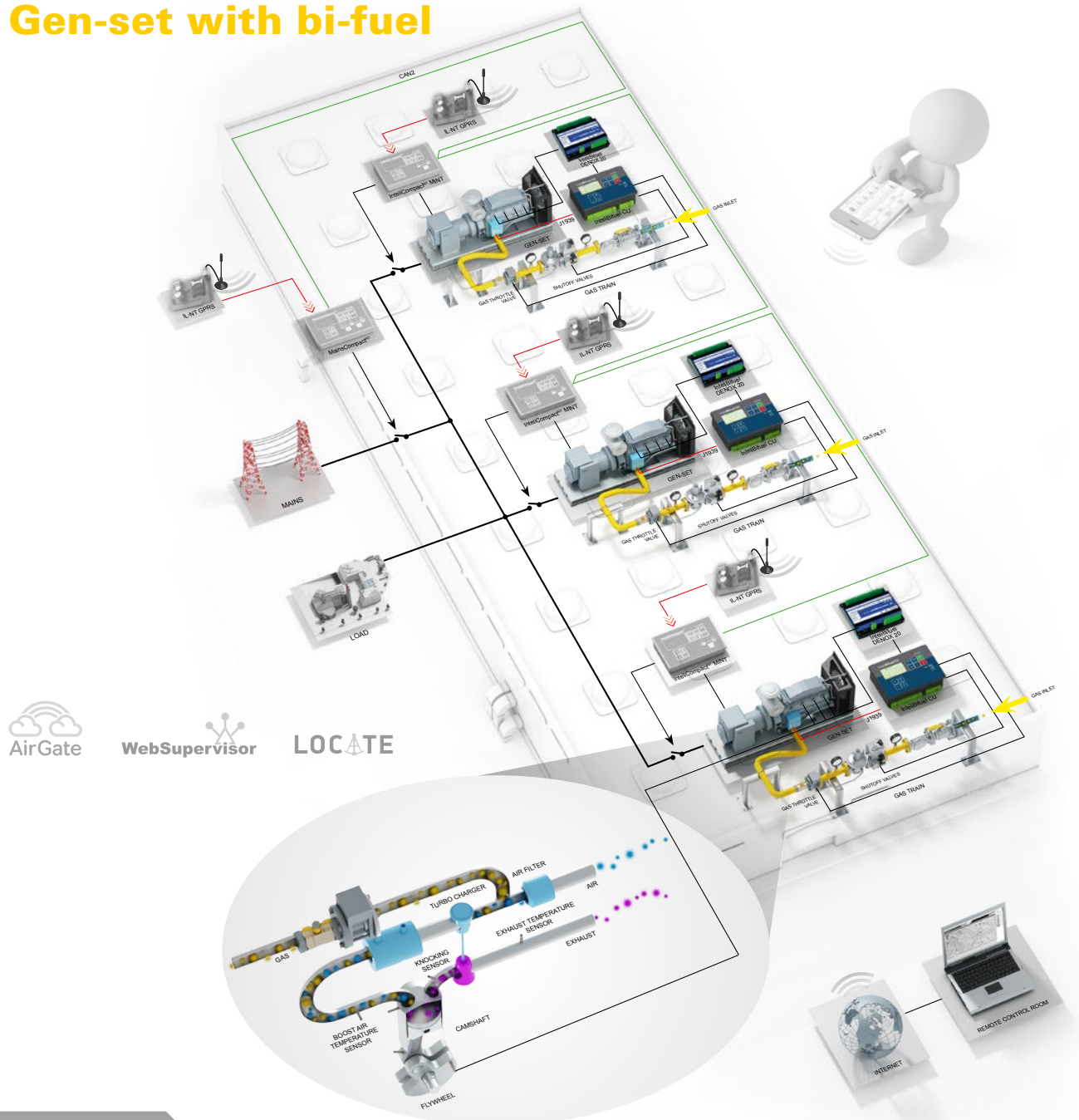


No ordinary engine controller features engine speed control, monitoring, propulsion load sharing. With IntelliDrive DCU Marine you get all this and more!





Gen-set with bi-fuel



Description:

- InteliBifuel does not interfere with the existing gen-set / engine controller therefore the functionality of the current application remains the same after bi-fuel conversion.
- The InteliBifuel conversion application is suitable for any type of gen-set/engine mode of operation (island, synchronization, paralleling).
- Financial savings are achieved via the substitution of up to 80% of the existing engines diesel consumption with gas (extended operating times without refuelling are also realized).
- InteliBifuel controllers offer fuel flexibility and seamless transition between diesel and bi-fuel operation modes as required (e.g. in case that gas is not available).
- Various types of gases can be used as the substitute fuel: natural gas, well gas, landfill gas, coal gas, propane gas, biogas etc.
- Possible emission reductions of CO_2 , NO_x , SO_x and PM can be expected compared to original 100% diesel operation.
- The InteliBifuel solution is a fully automatic solution which is mainly concerned with engine safety, gas is dynamically adjusted and optimised via a gas throttle valve.
- All parts and parameters of the bi-fuel solution are monitored and accessible from a single point.
- Excellent remote monitoring features.

Scope of supply:

- 3x InteliBifuel CU
- 3x InteliBifuel DENOX 20

About ComAp



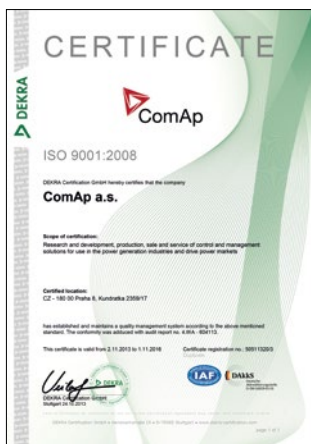


ComAp

ComAp is a dynamic international company with a solid reputation for delivering innovative electronic solutions to the power generation, industrial engine and equipment markets. By providing customers with state-of-the-art products, ComAp has built a name for delivering excellent reliability and good value.

Excellent and reliable product solutions

ComAp specializes in creating electronic control and management solutions for use in the power generation industries and drive power markets. Our portfolio of products, software and accessories is designed to support emergency power, standby power generation and engine driven applications all over the world. We also work closely with our customers to develop unique customized and turn key solutions for ordinary and extraordinary applications delivering high standards of excellence on every project.



ComAp products represent some of the most reliable solutions on the market today. Every component and product undergoes the most rigorous standards during manufacture, with every stage being undertaken in accordance with international ISO 9001 certification. Our products are backed with the approvals from major Marine Certification Societies. Accreditation

UEFA European Football Championship (National stadium in Warsaw)



at the highest-level breeds confidence, and every ComAp product is supplied with an appropriate warranty and after-sales support for complete peace of mind.

People make the difference

ComAp's key strengths are flexibility, experience, knowledge and enthusiasm. This blend of values defines our personality and gives you the assurance of a truly honest and positive relationship. By supporting our people, investing in their development and encouraging creativity, our teams work hard to find new opportunities, technologies and solutions that enable us to successfully help our customers solve their problems effectively.

At ComAp, we believe passionately in the importance of continuously developing new technology along with forward thinking software and hardware to maintain the enviable position as worldwide leader in communication and control for power generation and drive power applications.

At the heart of this process is a strong desire to exceed our customers' expectations by finding outstanding solutions for them and drawing upon the company's most valuable

F1 Singapore GrandPrix





asset – people. Over 80% of ComAp employees are graduates with specialized electronic and programming knowledge appropriate to the innovative development of market-orientated engine management systems. This unique know-how is matched by ComAp's significant investment at every stage of the research and development process, resulting in the creation of leading edge modern development facilities. ComAp is proud to continue being one of the top companies in the

world, an achievement which is challenging to sustain, but something we endeavour to preserve. We consistently set high standards, and try to be the best, something which is reflected by our achievement in the 'Best Employers Study in the Czech Republic' (conducted by Hewitt Associates), where we were awarded first place in 2009.

And, amidst fierce competition, in 2011 we were delighted to be amongst the top five companies in the Czech Republic once again. Our passion for excellence pushes us ever forward, and you can be sure that whatever the future brings, we will be there.

Putting customers first

ComAp's expertise extends beyond innovative controllers, our key strengths are flexibility, experience, knowledge and enthusiasm, enabling us to successfully help our customers solve their problems quickly and effectively. Using our vast global distribution network with 24 hour technical support, and a free dedicated training centre in Prague, we are able to work closely with our clients, maintaining the highest level of satisfaction, something we are very passionate about, and constantly strive to achieve.



Key Milestones

1991

ComAp is established.

1993

Successful commissioning of four Gen-set Control Systems made by ComAp on several islands in the Mediterranean.

1994

MX controller, the second generation of ComAp's gen-set control systems, is launched.

1996

PX, the revolutionary gen-set controller with configurable input and outputs, is developed.

2000

InteliGen, the first member of the Inteli family and flagship of their gen-set control systems, is released.

2001

ComAp Ltd. – The first foreign ComAp subsidiary is established close to Bristol.

2002

InteliSys, a top end product dedicated to CHP and large engine control applications, is released. New mid-range product InteliLite is launched for AMF and – InteliDrive controllers for non gen-sets, engine driven applications is released.

2006

ComAp LLC – ComAp subsidiary to promote products in the USA and Canada is established.

2007

InteliVision 8 – the first color display unit in the power generation field.

2008

InteliCompact – controller for simple paralleling gensets is launched.

2010

InteliVision 5 and InteliGen^{NT} BaseBox controller concept are released.

2012

Application for Apple iOS devices and Google Android devices is launched allowing product control via smartphones and tablets.

2014

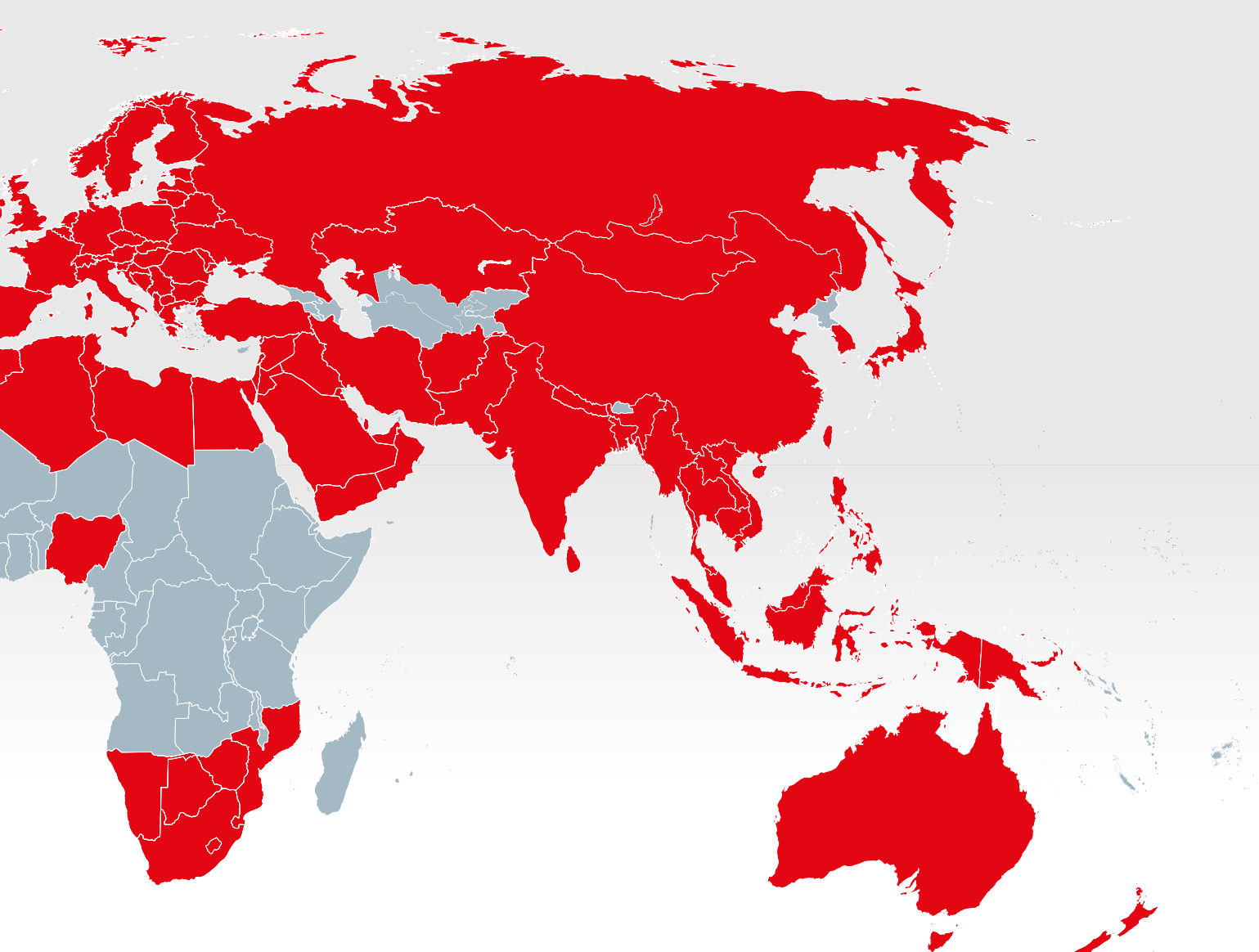
ComAp's WebSupervisor is translated into its 10th language: Portuguese.

Professional partnerships

ComAp's extensive global distributor network means that products are locally available in more than 100 countries, spanning every continent in the world. Through our professional and highly dedicated global distributor network we can satisfy customers' needs, however challenging.

Each ComAp distributor is carefully selected for their professionalism, product expertise and recognized quality standards and accreditation, and as such can advise customers on any matter relating to ComAp products and their applications.

 Afghanistan ComAp www.comap.cz	 Bulgaria ComAp www.comap.cz/cee	 Estonia Tapimec OY www.tapimec.fi	 Iraq ComAp www.comap.cz
 Algeria H-T-F www.h-t-f.fr	 Cambodia ComAp www.comap.cz	 Faroe Islands PTECH www.ptech.dk	 Ireland Industrial Power Units Ltd. www.ipu.co.uk
 Argentina Servintel International S.A. www.servintel.com	 Canada ComAp www.comapllc.com	 Finland Tapimec OY www.tapimec.fi	 Israel Generkal Industries Ltd. www.generkal.co.il
 Australia ComAp www.comap.com.au	 Chile Servintel International S.A. www.servintel.com	 France H-T-F www.h-t-f.fr	 Italy ComAp www.comap.cz/it
 Austria ComAp www.comap.cz/de	 China Jones Engineering Co., Ltd. www.jones.com.hk	 Georgia ComAp www.comap.cz/cee	 Japan Security Japan Inc. www.secjapan.jp
 Bangladesh Reverie Power & Automation Engineering Ltd. www.reverie-bd.com	 Colombia Ingenergia www.ingenergia.com.co	 Germany ComAp www.comap.cz/de	 Jordan Jabbour Datakom S.A.R.L. www.jabbourpower.com
 Belarus ComAp www.comap.cz/cee	 Costa Rica Propace Ingenieria, S.A. www.propace.net	 Greece A. Sapounas S.A. www.sapounas.gr	 Kazakhstan ComAp www.comap-russia.ru
 Belgium Controlin BV www.controlin.nl	 Croatia Koch D.O.O. www.koch.ba	 Greenland PTECH www.ptech.dk	 Kuwait ComAp www.comap.cz
 Bolivia ComAp www.comap.cz	 Czech Republic ComAp www.comap.cz/cee	 Hong Kong Jones Engineering Co., Ltd. www.jones.com.hk	 Laos ComAp www.comap.cz
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Order codes (The overview of selected products and their order codes)

Product name	Order code
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InteliNano ^{NT} AMF	IN-NT AMF
InteliNano ^{NT} Plus	IN-NT PLUS
InteliLite ^{NT} MRS 10	IL-NT MRS10
InteliLite ^{NT} MRS 15	IL-NT MRS15
InteliLite ^{NT} MRS 16	IL-NT MRS16
InteliLite ^{NT} AMF 20	IL-NT AMF20
InteliLite ^{NT} AMF 25	IL-NT AMF25
InteliCompact ^{NT} SPtM	IC-NT SPTM
InteliCompact ^{NT} MINT	IC-NT MINT
MainsCompact ^{NT}	MC-NT
InteliGen ^{NT}	IG-NT GC
InteliGen ^{NTC} BaseBox	IG-NTC-BB
InteliSys ^{NTC} BaseBox	IS-NTC-BB
InteliMains ^{NTC} BaseBox	IM-NTC-BB
InteliATS ^{NT} STD	IA-NT STD
InteliATS ^{NT} PWR	IA-NT PWR

Product name	Order code
InteliPro	INTELI PRO
MainsPro	MAINS PRO
InteliDrive Nano	ID-NANO
InteliDrive Nano WP	ID-NANO WP
InteliDrive Lite	ID-FLX-LITE
InteliDrive Lite EM	INTELI DRIVE EM
InteliDrive Lite FPC	ID-FLX FPC
InteliDrive DCU Industrial	ID-DCU
InteliDrive DCU Marine	ID-DCU MARINE
InteliDrive Mobile	ID-MOBILE
InteliDrive Mobile Logger	ID-MOBILE LOGGER
InteliBifuel 2	IBF-2
InteliBifuel 20	IBF-20
InteliVision 5	INTELIVISION 5
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Kundratka 2359/17, 180 00 Prague 8
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Phone: + 420 246 012 111
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