

PRODUCT GUIDE



Electronic edition – Power generation applications





The interactive simulator provides a taste of the new IntelliVision, with demo and preview options illustrating screen information and function.



**simulator
ONLINE**

InteliVision

InteliVision is a new generation colour display unit for either InteliGen^{NT} / InteliSys^{NT} or InteliDrive controllers. It is designed as a simple, easy to use Plug and Play solution, which also features our unique TRENDS monitoring as a standard feature.

It is the first colour display in the Power Generation field. More info on page 54.



www.comap.cz/intelivision



SWITCHED ONTO INNOVATION

InteliDrive[®] MOBILE

The InteliDrive Mobile is a highly flexible sophisticated mobile electronic controller, which features outstanding control, monitoring and protection for diesel and gas engines as well as driven technology.

The new controller offers range of specific functions suitable for mobile applications as hydraulic system control, communication with sensors and operational devices control.

Most commonly, these tailored applications meet the specific control requirements of mobile hydraulics, engine driven compressors and pumps.



InteliCompact^{NT}

InteliCompact^{NT} models are new integrated controllers for gen-sets operating in both standby and parallel modes. Functionality, optimized for ease of use, installation and configuration, includes built-in synchronizer and digital isochronous load sharer.

... more on page 14

ATION



more on page 40



InteliATS^{NT}

The new IntelliATS^{NT} controllers are designed to monitor the incoming AC mains supply (1 or 3 phases) for under voltage, over voltage, under frequency, over frequency and voltage unbalance.

... more on page 8



WELCOME TO OUR PRODUCT GUIDE

Following the positive feedback from our first Product Guide we have updated the second issue with more information on an ever-growing range of control products. In the meantime, our design and development teams have worked very hard to create exciting new control solutions to meet customers' application needs – all of which are detailed in the new guide.

We hope you find it just as useful and practical as before. Inside you will find technical information, product features and functions, alongside customer feedback on how the products have performed in the field. 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

Overall the offers a comprehensive guide to our entire range of products and accessories. I hope you find it both helpful and invaluable.

Regards
Libor Mertl – Managing Director



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IA-NT, IL-NT, IC-NT, MC-NT, IG-NT,
IS-NT, IGS-NT, IM-NT, ID, IV ...

What do all those abbreviations mean? It's easy. Go to page 62!



Applications

Power generation applications

66

This section demonstrates the flexibility and capability of ComAp power generation control solutions by illustrating a wide range of applications including single gen-sets, multiple sets operating in parallel and complex CHP (cogeneration) applications. Each example shows how ComAp control products integrate seamlessly to deliver a complete and effective control and monitoring package for both typical and complex power applications.

Drive power applications

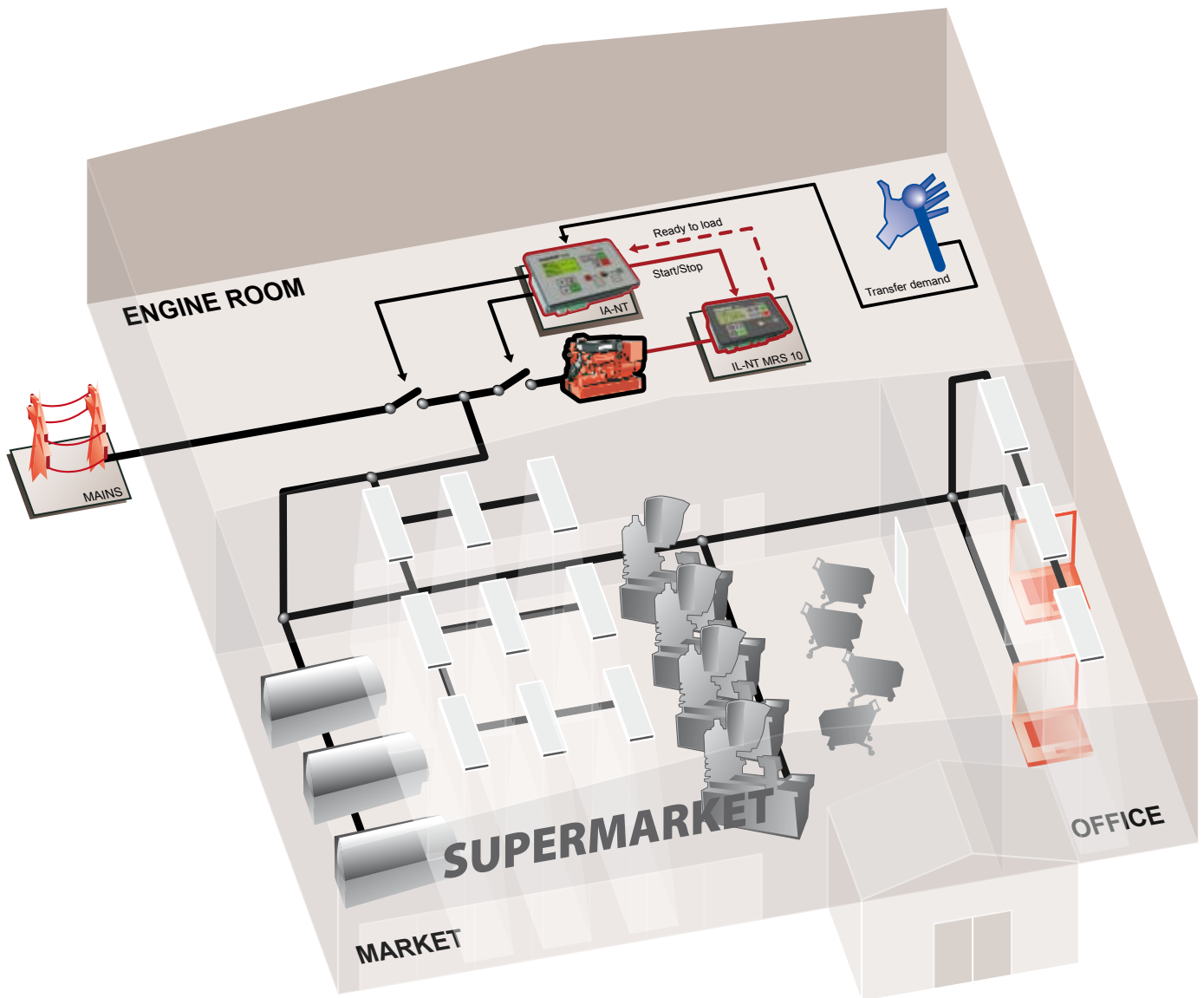
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ComAp drive power control products are suitable for a wide range of diesel engine powered plant and equipment. The following applications are just a small selection to demonstrate the versatility of ComAp drive power products and accessories for use in this demanding market.





Open / delayed transition – manual transfer demand



Description:

- Stand-by gen-set. IA-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.
- IA-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 IA-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:

- 1× IA-NT STD
- 1× arbitrary gen-set controller (e.g. IL-NT MRS 10) or key start box



Prime mover system

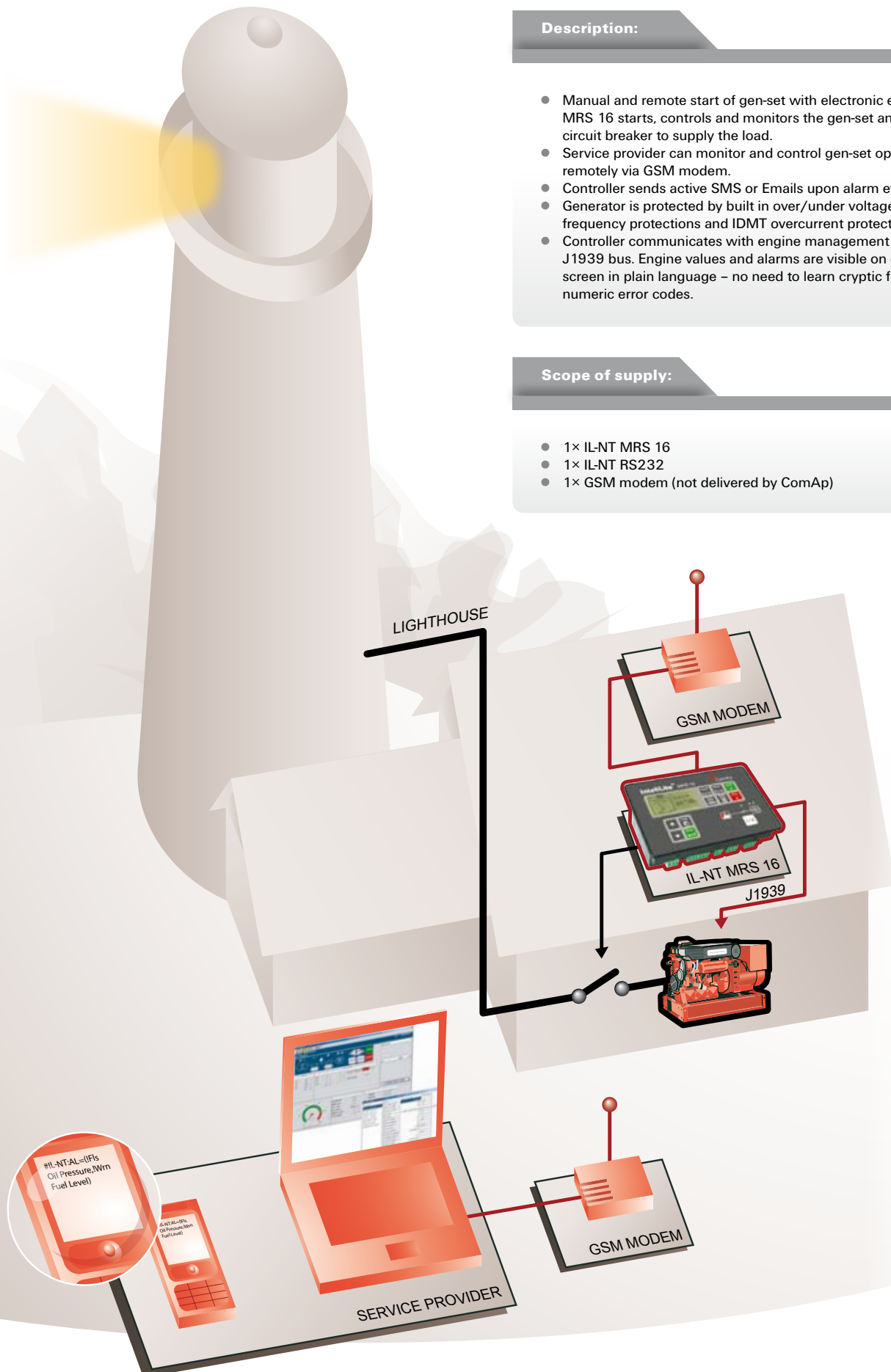
- remote monitoring via GSM

Description:

- Manual and remote start of gen-set with electronic engine. IL-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 GSM modem.
- Controller sends active SMS or Emails upon alarm event.
- Generator is protected by built in over/under voltage and frequency protections and IDMT overcurrent protection.
- Controller communicates with engine management unit by CAN J1939 bus. Engine values and alarms are visible on graphical LCD screen in plain language – no need to learn cryptic flashing or numeric error codes.

Scope of supply:

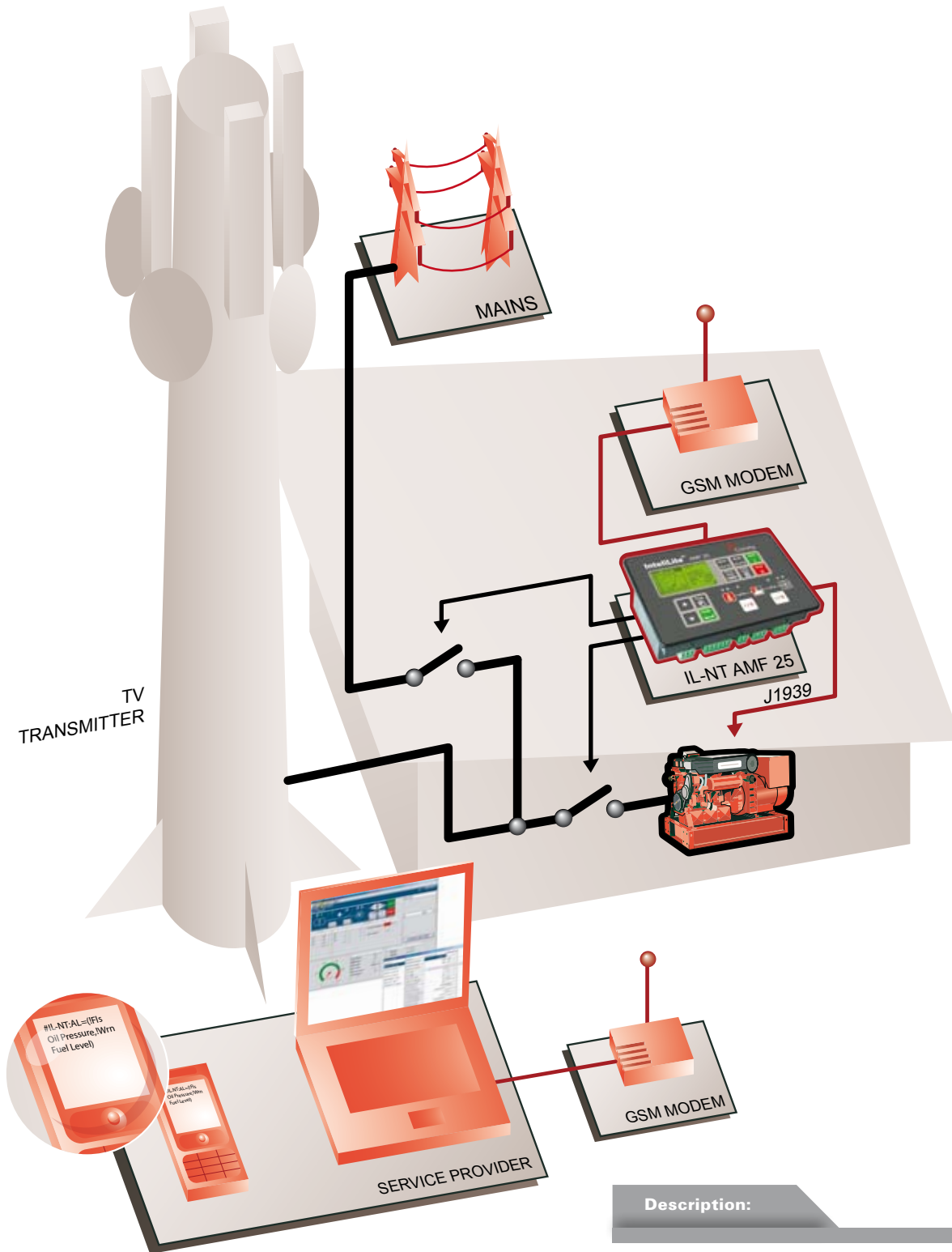
- 1× IL-NT MRS 16
- 1× IL-NT RS232
- 1× GSM modem (not delivered by ComAp)





Standby system

- remote monitoring via GSM



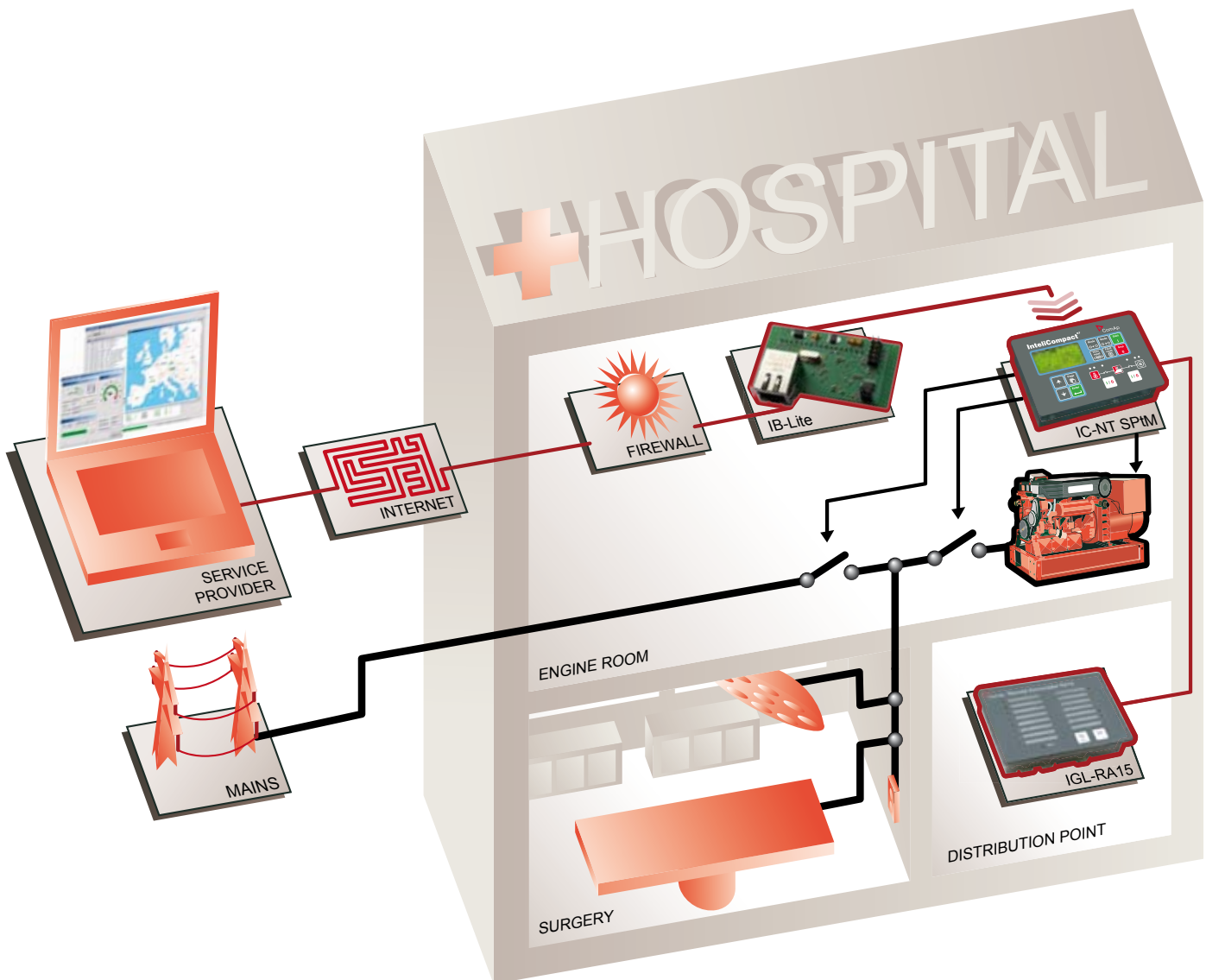
- Scope of supply:**
- 1x IL-NT AMF 25
 - 1x IL-NT RS232
 - 1x GSM modem (not delivered by ComAp)

Description:

- Stand-by gen-set with electronic engine. IL-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.
- Service provider can monitor gen-set operation remotely via GSM modem.
- Generator is protected by built in over/under voltage and frequency protections and IDMT overcurrent protection.
- Controller communicates with engine management unit by CAN J1939 bus. Engine values and alarms are visible on graphical LCD screen in plain language – no need to learn cryptic flashing or numeric error codes.



Standby system with soft return - remote supervision via Internet



Description:

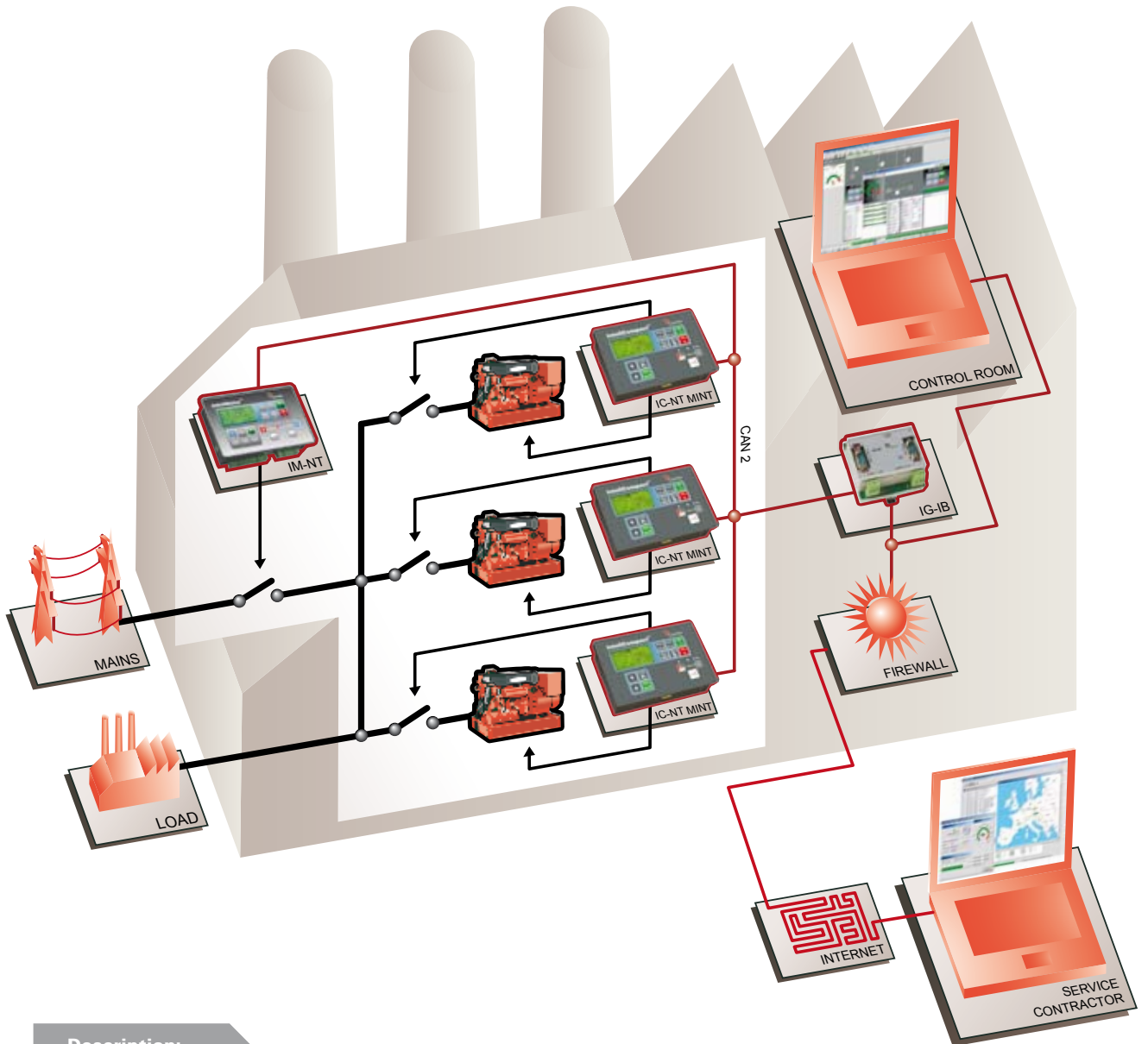
- Stand-by emergency gen-set accomplishes power supply to essential load during power drop.
- Controller automatically starts the gen-set in case of mains failure and switches load to generator. When mains returns, it synchronizes the generator back, softly unloads it and stops the engine.
- Generator 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.
- Service contractor connected via Internet and IntelliSupervisor PC software has complete information on status and performance of gen-sets. Each important alarm immediately pops-up on PC screen.
- IntelliSupervisor is used for supervision of complete fleet of gen-sets located on many sites.
- History file with performance log stored in IC-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:

- 1× IC-NT SPtM
- 1× IG-AVri
- 1× IG-AVri-TRANS/LV
- 1× IB-Lite



Multiple gensets in parallel to grid – remote monitoring and supervision via Internet



Description:

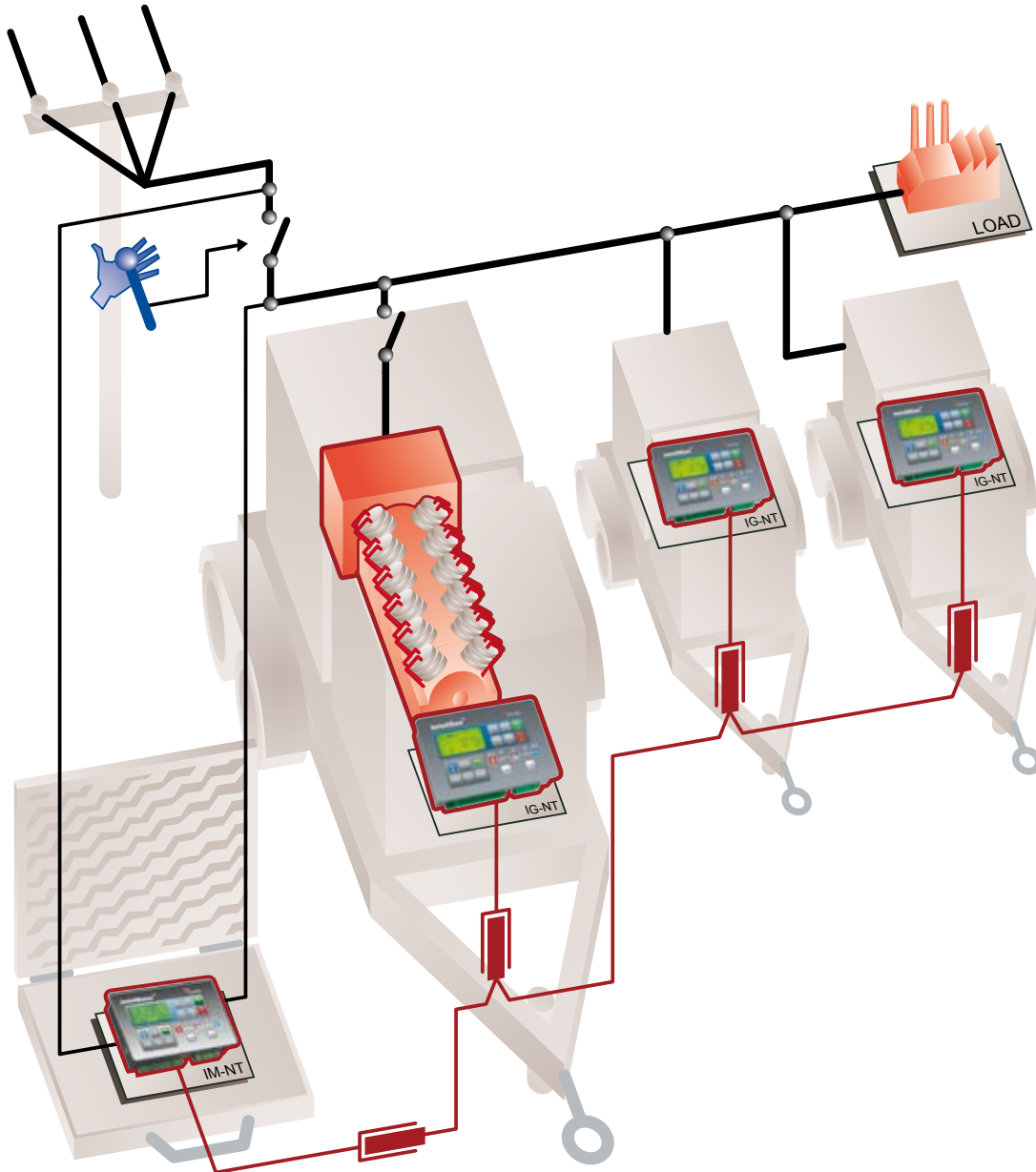
- Fully automatic system reduces electric energy bill by keeping the mains power below high tariff level during peak hours.
- At the same time it accomplishes emergency standby power in case of mains failure.
- Remote control and monitoring uses available factory LAN for connection between a Power house and a Control room
- Service contractor connected via Internet and IntelliSupervisor PC software has complete information on status and performance of gen-sets. Each important alarm immediately pops-up on PC screen.
- IntelliSupervisor is used for supervision of complete fleet of gen-sets located on many sites.
- Wide range of engine and generator protections, including vector-shift protection.
- Automatic forward and reverse synchronization with soft load ramp-up and ramp-down during changeover.
- Active and reactive load import/export control and load-sharing.
- Automatic optimization of number of running sets according to load.
- Peak loping controlled by built in Scheduler, engines automatically run during peak period.
- History file with performance log stored in IC-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.

Scope of supply:

- | | |
|-----------------------|--------------------|
| ● 3× IC-NT MINT | ● 1× IM-NT |
| ● 3× IG-AVRi | ● 1× IG-IB |
| ● 3× IG-AVRi-TRANS/LV | ● 1× IG-IB3 dongle |



Rental sets



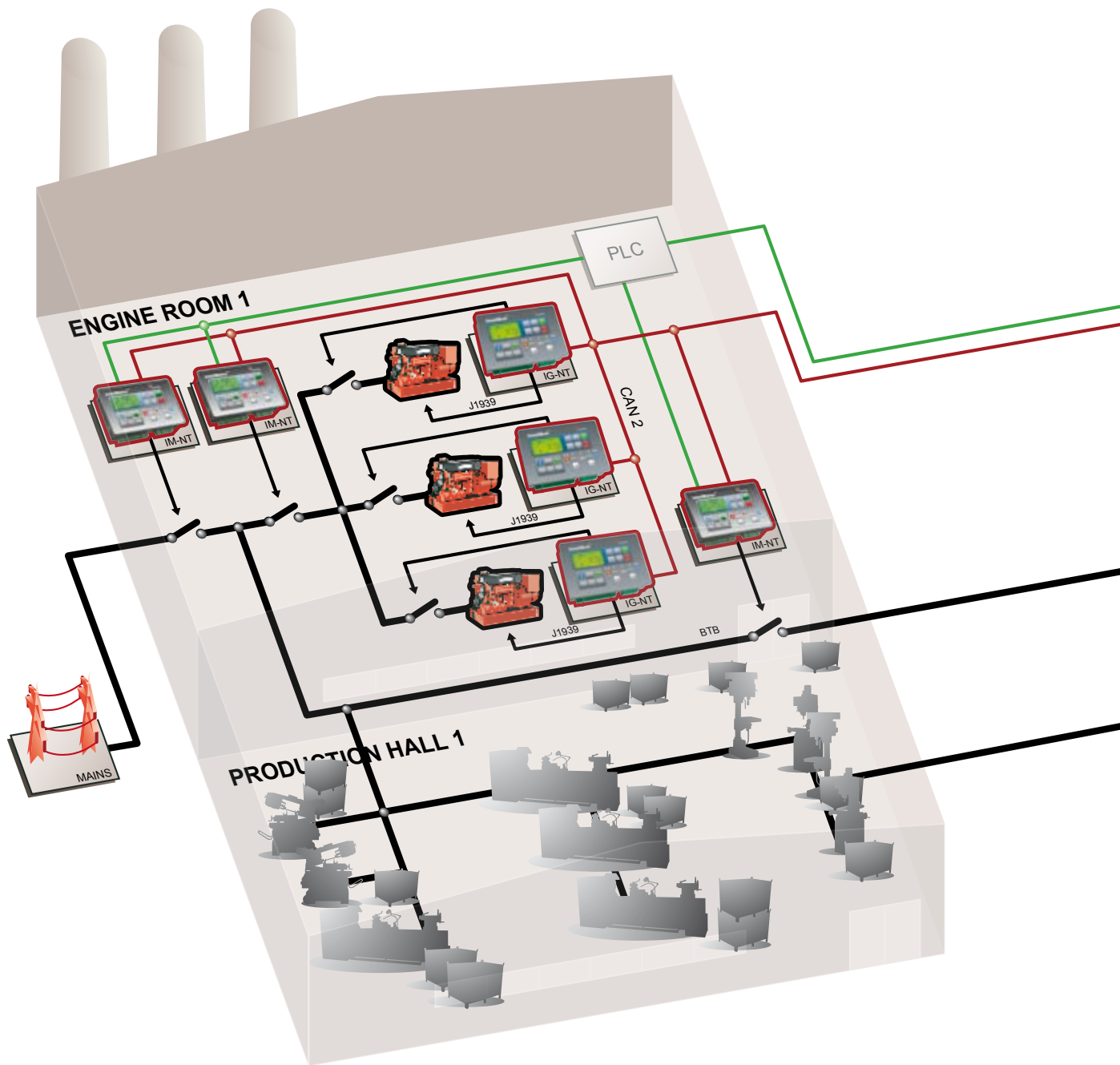
Description:

- Containerized rental gen-sets can be used for maintenance of power lines without interruption of power delivery to end consumer.
- Gen-sets are connected one-by-one to mains at the consumer's end and manually loaded. Power line is then manually disconnected and consumer is powered from generators running in parallel.
- The group of gen-sets is reverse synchronized to mains after finalization of maintenance on power line. IntelliMains^{NT} keeps generators and mains in synchronism enabling manual reconnection to power line.
- IntelliMains^{NT} is built in a small shock proof suitcase.
- Interconnection of containers is done by color coded not-interchangeable connectors.
- 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.
- Frequency selector enables switching between 50Hz/230V and 60Hz/277V mains.

Scope of supply:

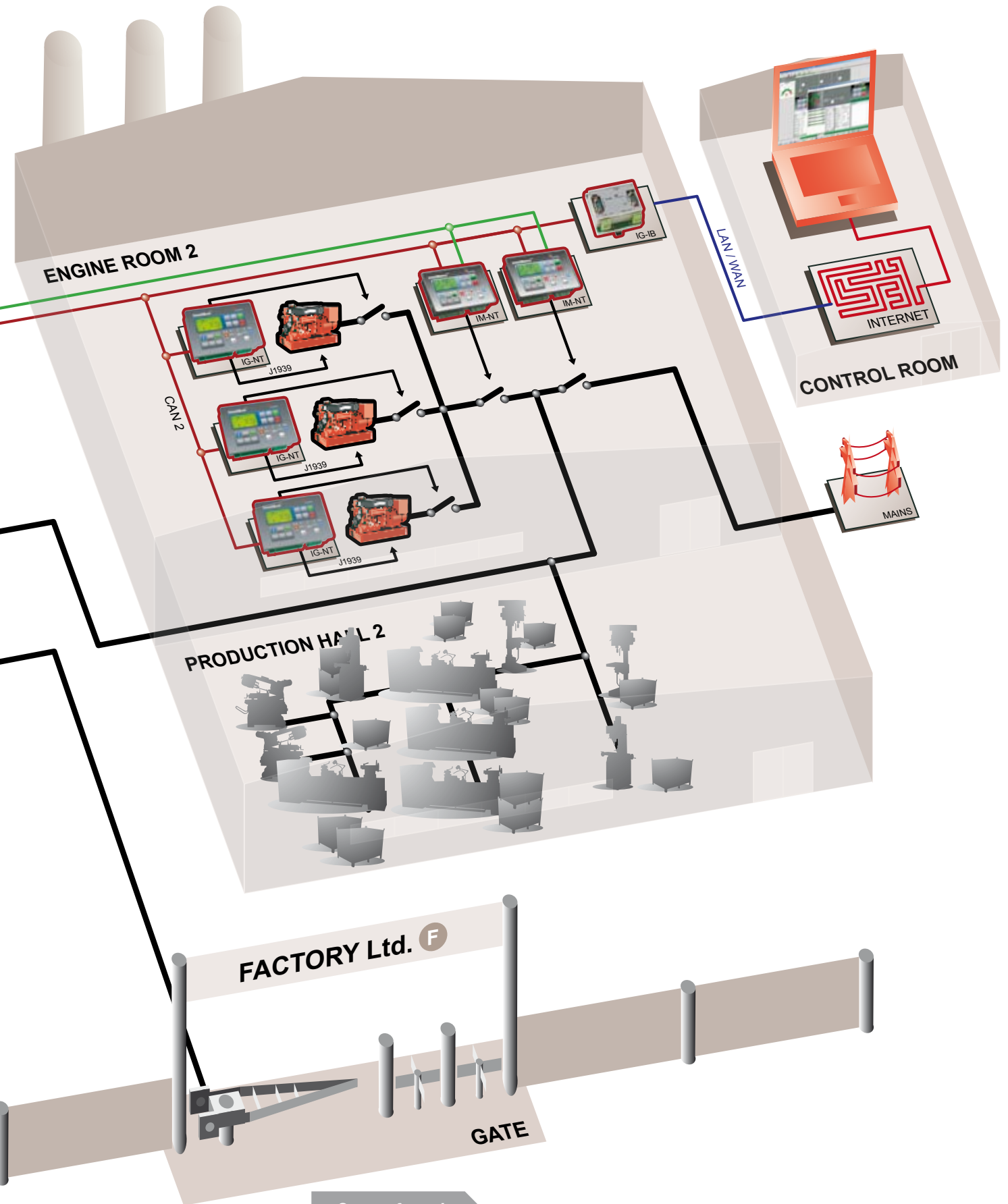
- 3× IG-NT
- 3× IGS-NT-LSM+PMS dongle
- 3× IG-AVRi
- 3× IG-AVRi-TRANS/LV
- 1× IM-NT

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.
- Complex switching algorithm running in external PLC defines which breakers are opened and which are closed independent on availability of two mains and gen-sets.
- Reverse synchronizing on both feeders and on bus-tie breaker is accomplished by 5 IntelliMains^{NT} modules controlled by external PLC.
- 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 IG-IB to all controllers.

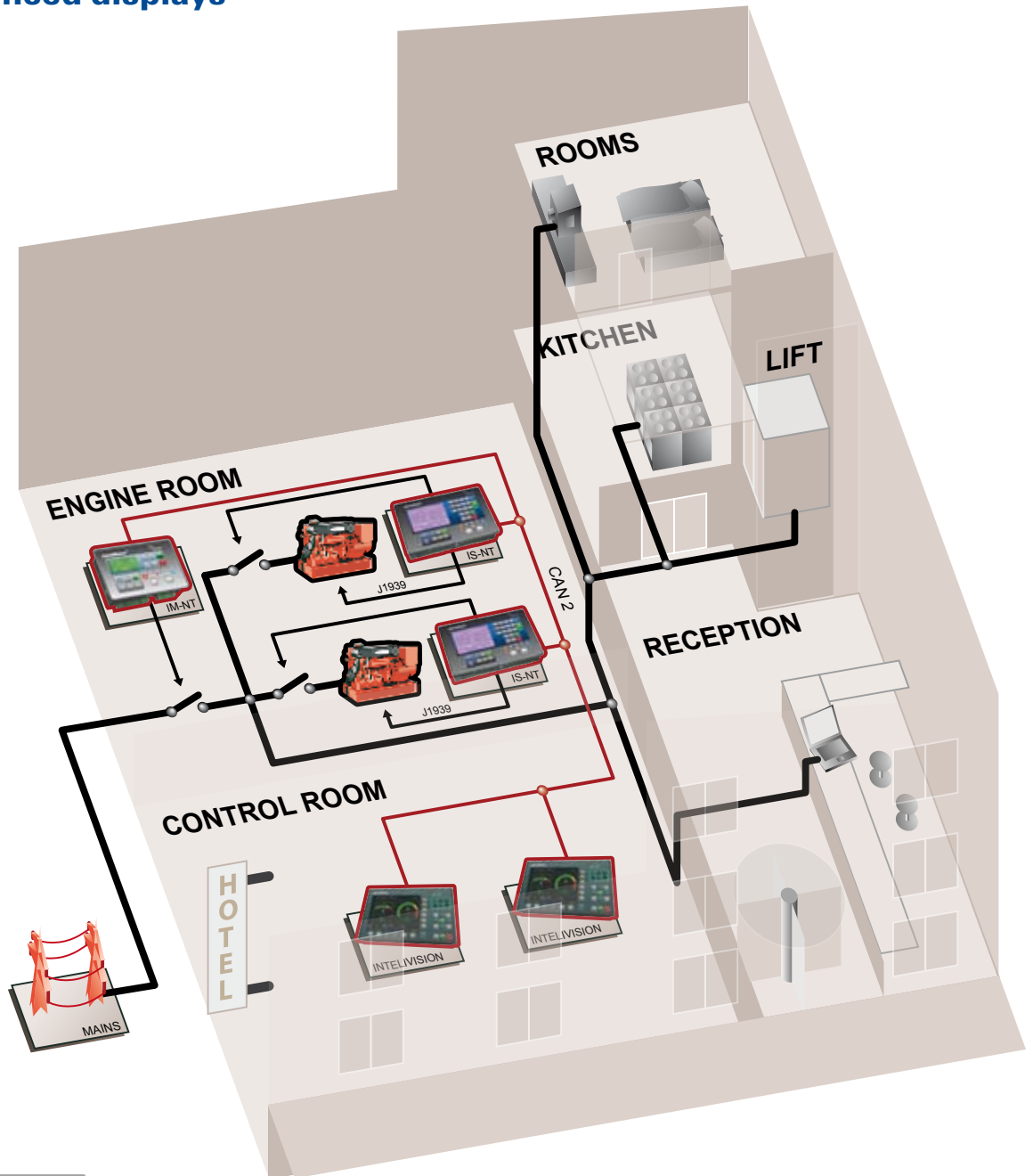


Scope of supply:

- 6× IG-NT
- 6× IGS-NT-LSM+PMS dongle
- 6× IG-AVRi
- 6× IG-AVRi-TRANS/LV
- 5× IM-NT
- 1× IG-IB
- 1× IG-IB 15 dongle
- 1× optional PLC
- (not delivered by ComAp)



Standby system with load shedding – advanced displays



Description:

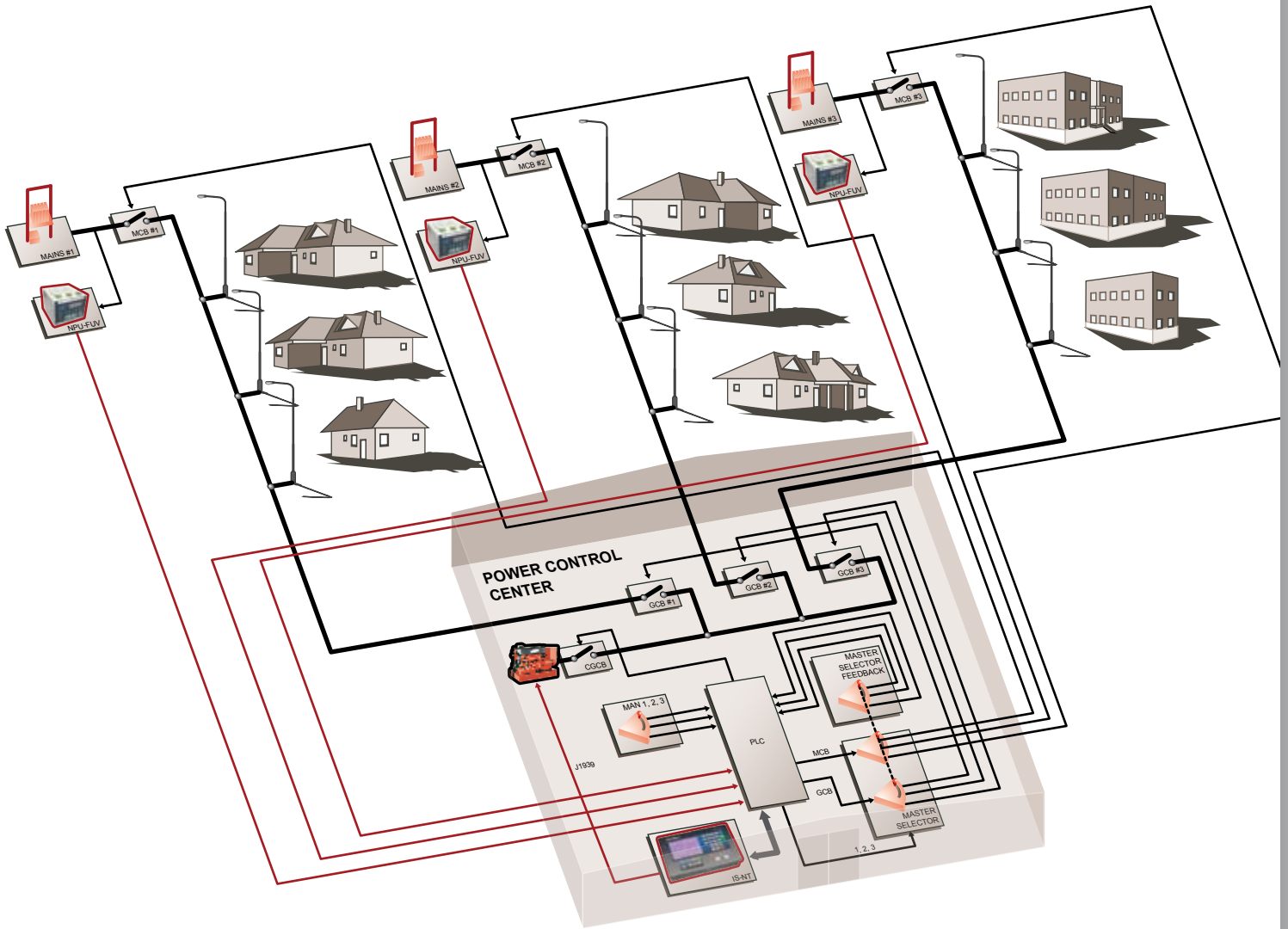
- The system guarantees emergency standby power in case of mains failure.
- IM-NT provides AMF function and activates mains to gen-sets changeover in the case of mains failure no break return to mains.
- Load shedding can take place during the changeover to trip the unessential load when gen-set goes 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 gen-set 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.
- The second gen-set can be used as a backup set.
- History file with performance log stored in IS-NT allows easy backtracking and problem solving.

Scope of supply:

- 2× IS-NT
- 2× IGS-NT-LSM+PMS dongle
- 2× IntelliVision
- 1× IM-NT
- 2× IG-AVRi
- 2× IG-AVRi-TRANS/LV



More loads - multiple grids



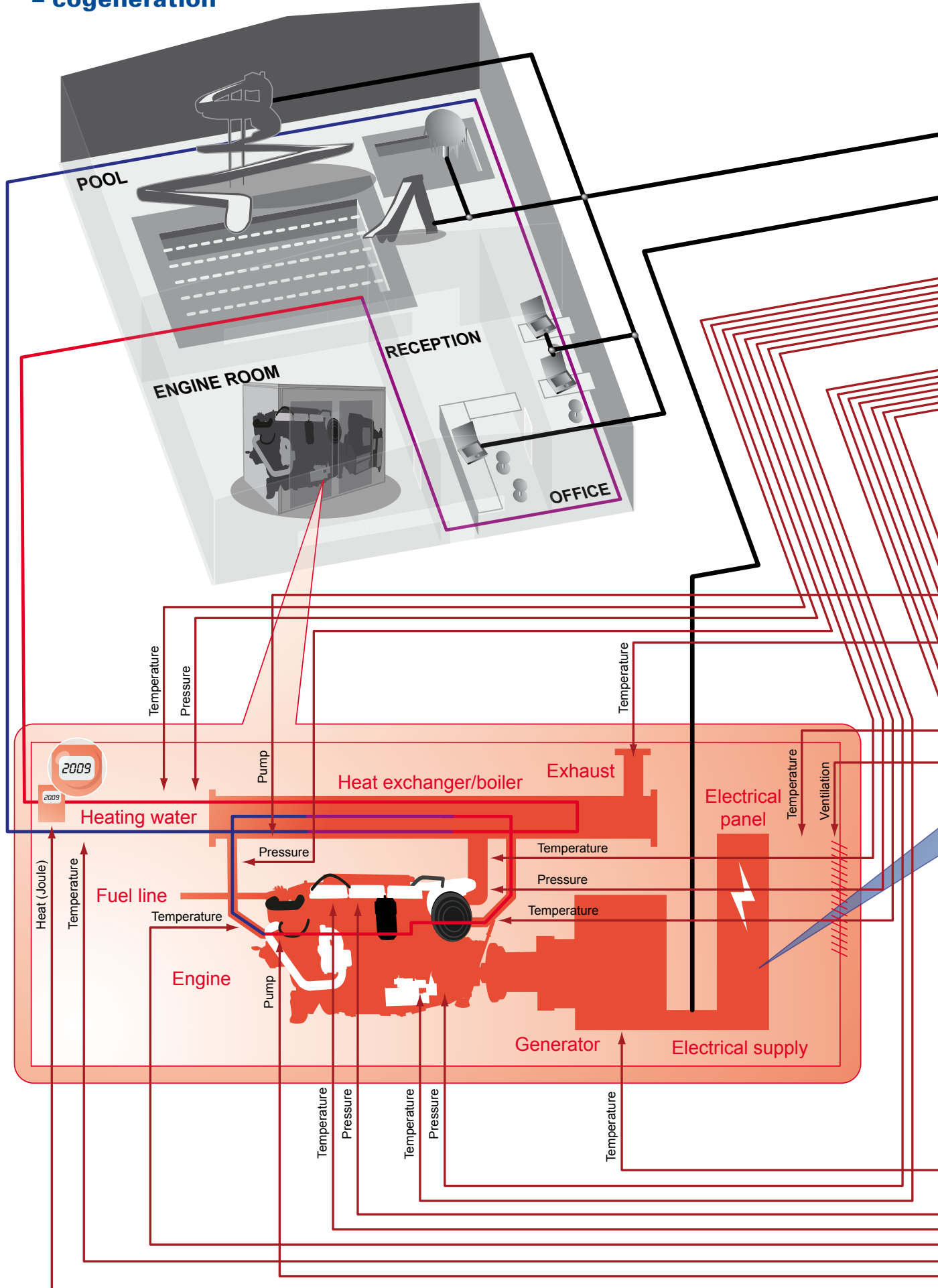
Description:

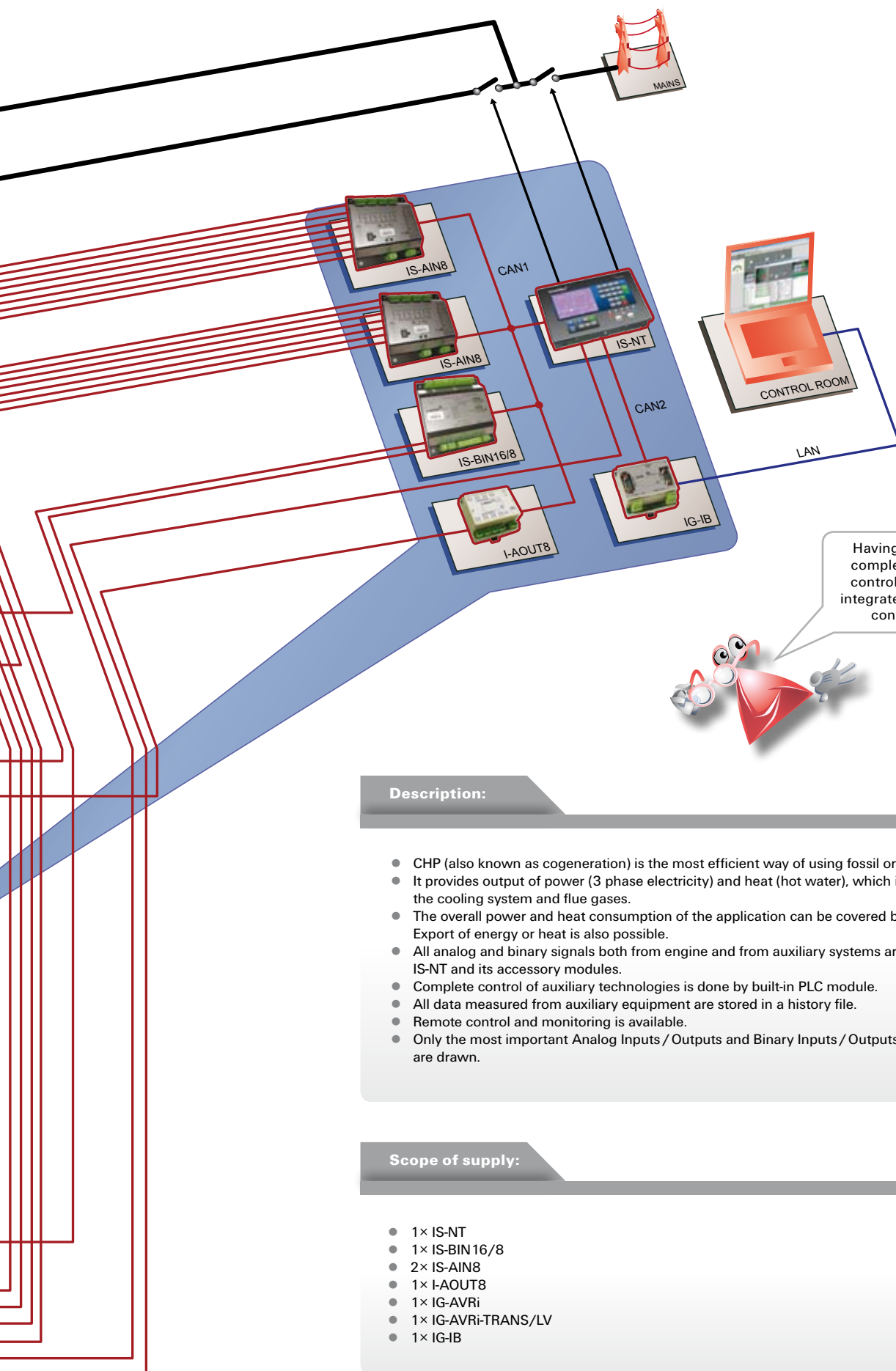
- In case of manipulation, the system switches from one branch to another by turning of the Master Selector Switch (MSS): BO MSS turn is used to turn the MSS.
- The mains voltage measurement, generator current measurement, MCB and GCB feedbacks, MCB and GCB control signals and Mains Failure (MF) signals (NPU 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 NPU 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 NPU 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, IS-NT 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:

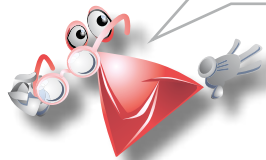
- 1× IS-NT
- 3× NPU
- 1× IG-AVRi
- 1× IG-AVRi-TRANS
- 1× PLC (not delivered by ComAp)
- 1× Motorized rotary switch with 3 × 16 contacts (not delivered by ComAp)

Combined heat and power (CHP) - cogeneration





Having problems with the complexity of your current control system? IntelliSys^{NT} integrates all functions in one convenient solution.



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 IS-NT 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:

- 1× IS-NT
- 1× IS-BIN 16/8
- 2× IS-AIN8
- 1× I-AOUT8
- 1× IG-AVRi
- 1× IG-AVRi-TRANS/LV
- 1× IG-IB

Satisfied Customers Worldwide

USA

Boss Industries



"ComAp's compressor and engine control panel solution optimizes natural gas production on Boss's booster units by providing accurate process control using digital pressure transducers. Our customers are very happy with its event history capabilities as well as its compressor and engine protective features. We also value the fact that the ComAp ID-DCU panel is fully compatible with future electronic emission certified engines and control capabilities. BOSS Industries has standardized on the ComAp panel for our gas well booster compressor units."

Ed Ketcham
VP Sales
www.bossair.com



Canada

Simson-Maxwell



"When I first saw IntelliVision, I immediately recognized its potential for our power generation systems. The large easy to read color display and customer-friendly interactivity is precisely what our customers have been looking for. We have already installed systems with IntelliVision and received very positive feedback from our customers on the units performance."

Santokh Sahota
Engineering Manager
www.simson-maxwell.com



Netherlands

Sandfirden Technics



"All our generator sets and propulsion engines are equipped with a ComAp engine controller, ID-DCU Marine. They are approved by all major Ship Classification Companies. The units fulfill our high quality standards, have many applications and are widely used. Remote monitoring is one of them, which Sandfirden Technics is using in some cases."

Harry Jasper
Service Department
www.sandfirden.nl



Slovakia

ELTECO



"We admire ComAp products because of their innovative features. These include forward looking technological development of monitoring; the ability to solve non-standard customers' requirements and the huge spectrum of opportunities for running of power supplies."

Peter Šiška
Chief of Application and costing
estimation department
www.elteco.sk



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.



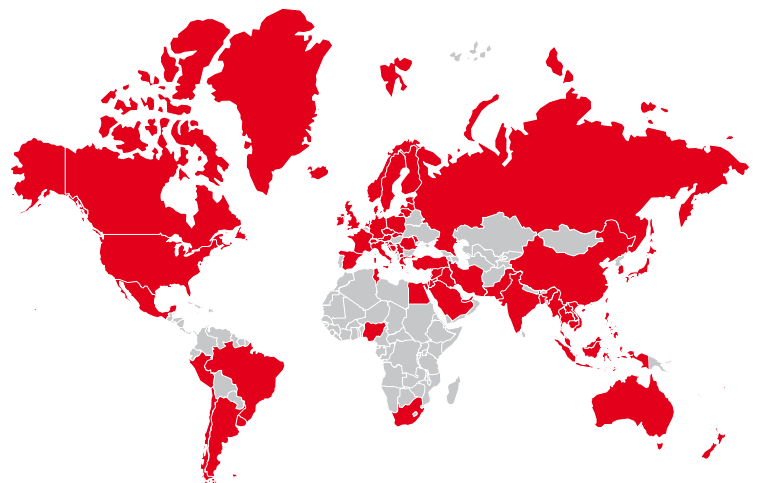
ComAp products represent some of the most reliable solutions on the market today. Every component and product undergoes the most rigorous standards during manufacture, with every stage being undertaken in accordance with international ISO 9001 certification. Our products are backed with the approvals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

Societies. Accreditation 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.

Professional partnerships

ComAp products are directly available in more than 60 countries, spanning almost 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.



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 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 consistently set high standards, reflected in our third place in the 'Best Employers Study in the Czech Republic' (conducted by Hewitt Associates) in consecutive years (2006 and 2007).

ComAp Systems

ComAp's expertise extends beyond innovative controllers to include a range of subsidiary businesses specializing in related services including bi-fuel conversions, power energy systems solutions and electronic component distribution.

These subsidiaries are located in key strategic regions around the world ensuring our customers benefit from local capability coupled with global reach. Most of them are named ComAp Systems and more information is available on each business at www.comapsystems.com.

Key Milestones

1991

Establishment of ComAp.

1993

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

1994

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

1996

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

1999

The strategic co-operation with HuegliTech Company significantly increased our distribution network.

2000

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

2001

ComAp Ltd. – 100% UK based ComAp subsidiary was established close to Bristol.

2002

InteliSys, our top end product dedicated to CHP and large engine control applications, was released. New mid-range product InteliLite was launched for AMF and MRS applications.

2004

InteliDrive controller for non gen-set, engine driven applications was released.

2006

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

2007

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

2008

InteliCompact – controller for simple paralleling gensets.



Manufacturer

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Local Distributor / Partner

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