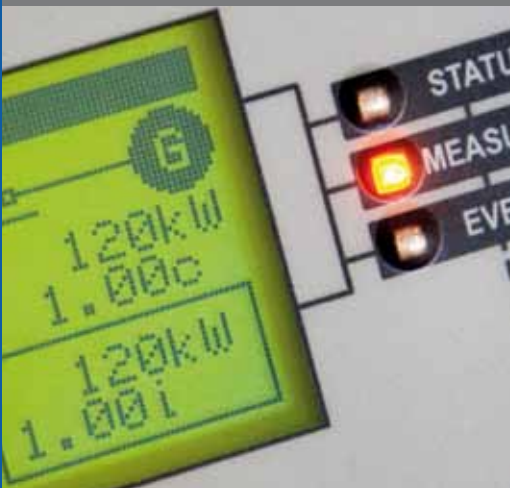




GENSET CONTROL



HUEGLI TECH AND SICES

HUEGLI TECH has a long and proud history in the electronic control of diesel, gas and dual-fuel engines. As the Manufacturers Representative for American Bosch products, initially in Switzerland and later expanding to represent the brand throughout Europe the Middle East and Asia, HUEGLI TECH introduced many well-known OEMs to electronic governing systems.

When GAC began manufacturing improved versions of the original American Bosch products, it was HUEGLI TECH that worked with virtually all diesel engine manufacturers in our territory to introduce integral actuator solutions for their engines.

In this age of electronic engines both HUEGLI TECH and GAC have taken the logical step of expanding into the supply of

the next level of electronic control and management. Since 2000 we have worked exclusively to establish the ComAp brand throughout our territory. Today we are introducing controllers under our own name for the first time. Manufactured by SICES, these controllers offer a build-quality and operational flexibility that is second-to-none. In conjunction with GAC's own GNS series, we can now offer a comprehensive range of control solutions from simple remote start single sets to multiple CHP installations with or without multiple mains incomers.

Your engine manufacturer* trusts us you can too!

*MAN, Deutz, MTU, MWM, Scania, Volvo, Sisu, Cummins, Caterpillar, Doosan, Lombardini, Liebherr, Hatz, Faryman, Greaves, Tata, Bukh, Iveco, etc.



Typical Applications

- Power Generation
 - single gensets in standby
 - multiple gensets in parallel to the grid
 - rental sets
 - landfill gas installations
 - emergency gensets
- Oil & Gas
- Marine
- Transportation
- Mining
- Industrial Refrigeration & Cooling

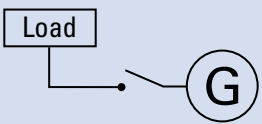
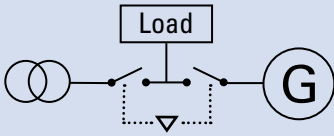
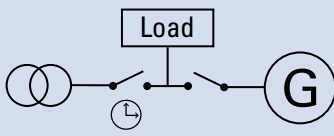
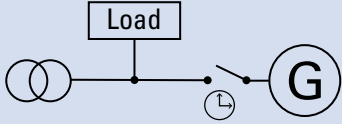
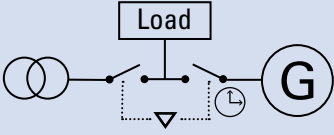
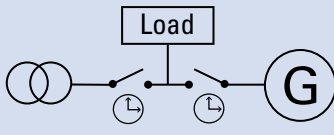
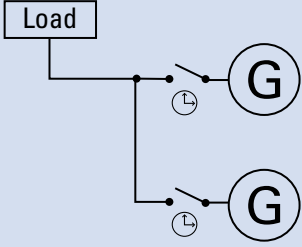
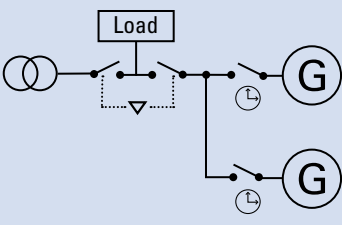
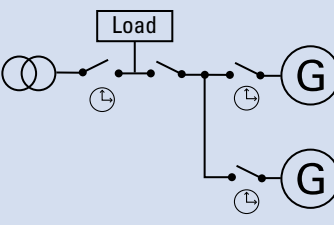




The Benefits

- We are a total solution provider
- You can benefit from our 80 years of experience
- Our experienced team can provide you professional support
- We provide theory and hands-on training on real engines and gensets (1 x diesel engine, 1 x bi-fuel engine, 1 x gas engine; island parallel or parallel to mains).
- HT controllers have many options included in the main unit (e.g. additional I/O , communication ports).
- HT Controllers are supplied with individual final test reports
- HT Controller configuration is straightforward and consistent
- Supervising PC software is available for standard and more complex applications
- ISO 14001 certified production demonstrates our responsibility for our environment

DESIGN & OPERATING PRINCIPLE

	No MCB	MCB Controlled	MCB Synchronized
GCB Controlled	 <p>MRS (SPM)</p>	 <p>AMF (SSB)</p>	 <p>SPtM</p>
GCB Synchronized	 <p>SPI</p>	 <p>SPtM (SSB+SSTP)</p>	 <p>SPtM (SSB)</p>
No parallel to mains	 <p>MPM</p>		
Parallel to mains		 <p>MINT</p>	 <p>MINT (MSB)</p>

⌚ Synchronized

⏏ ATS



THE RIGHT CONTROLLER FOR DIFFERENT NEEDS

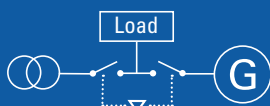


MRS (SPM)

Single Prime Mover

GCB controlled, no MCB

HT-GC310 / HT-GC350

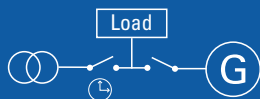


AMF (SSB)

Single Stand-By

GCB controlled, MCB controlled

HT-GC310 / HT-GC350

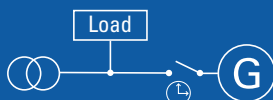


SPtM

Single set Parallel to Mains with AMF

GCB controlled, MCB synchronized

HT-GC500 + PWM module or HT-DST4602



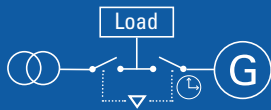
SPI

Short or long time Parallel (no MCB)

GCB synchronized, no MCB

HT-GC500 + PWM or HT-DST4602

THE RIGHT CONTROLLER FOR DIFFERENT NEEDS

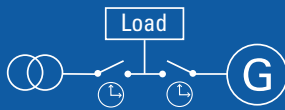


SPtM (SSB + SSTP)

Single set Parallel to Mains with AMF

GCB synchronized, MCB controlled

HT-GC500 + PWM or HT-DST4602

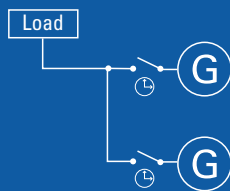


SPtM + SSB

Single set Parallel to Mains with AMF

GCB synchronized, MCB synchronized

HT-GC500 + PWM or HT-DST4602

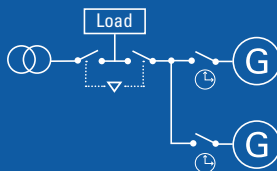


MPM

Multiple Prime Mover

Parallel island, no Mains

HT-GC500 + PWM module or HT-DST4602

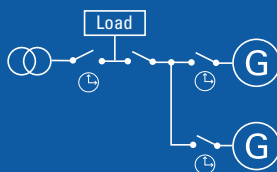


Mint

Multiple parallel to mains, standby, no MCB synchronized

Parallel gensets, with mains, MCB controlled

HT-GC500 + PWM module + HT-MC100 or HT-DST4602 + HT-MC100



Mint (MSB)

Multiple parallel to mains, standby, MCB + GCB synchronized

Parallel gen-sets, with mains, MCB + GCB synchronized

HT-GC500 + PWM module + HT-MC100 or HT-DST4602 + HT-MC100



CONTROLLER RANGE

HT-GC310



HT-GC350



GENSET CONTROLLER

AMF genset controller

The HT-GC310 is a high quality, reliable controller offering all the standard features required for the most common single generator applications (Single Prime Mover and Single Stand-by).

Advanced AMF genset controller

This is an advanced controller for generator sets operating in single stand-by mode, offering high performance benefits.

In addition to the features of the HT-GC310 controller the HT-GC350 is equipped with additional I/Os and communications possibilities, which allows its use in customized and non-standard applications.

Marine Classifications

HT-GC350 R



HT-GC500




Multiple Parallel genset controller

HT-GC500 is an advanced and very flexible controller which is particularly suitable for groups of up to 16 gensets running in parallel, with or without Mains.

This controller has been designed to simplify installation and operation due to its internal Load Sharing (by CAN interface), Synchronizer (via CAN or PWM output) and VAR regulation.

Marine Classifications

HT-GC500 R 

HT-DST4602



AMF and PARALLEL genset controller

HT-DST4602, the upgraded replacement for HT-DST4601/PX + DICHRON, is a highly configurable genset controller designed to handle a broad range of critical and complex parallel applications, including multiple Mains and CHP systems. It now includes an internal load sharing unit that allows simple implementation of Multiple Prime Mover applications. The unit also now includes a range of useful PLC functions (including PID blocks) to cover application-specific requirements.

Display

Base Box



Splitted Version

A split version is also available. This consists of two units: a display unit, to be mounted on the front panel and a Base Box to be mounted inside the panel. They are interconnected by differential transmission line in order to obtain great immunity and communication safety.

MAINS CONTROLLER

HT-MC100



Parallel system supervisor

The HT-MC100 controller is designed to manage multiple parallel systems. The unit is able to control the global circuit breaker and generator functions operating as a Master unit. Its automatic control functions are well suited for many different types of power plants with and without MCB and MGCB management.

The HT-MC100 can be combined with the HUEGLI TECH controllers for paralleling / synchronizing, e.g. HT-GC500 and HT-DST4602 and communicates via PMC-Bus over CAN.



MODULE RANGE

CAN BRIDGE



allows extension of the bus, both in generator numbers and bus length. It filters all not needed messages, separating the internal communication from the external. It can acquire measurements from auxiliary devices by 2 additional Modbus lines.

ROUTER GSM



allows using a single GSM modem for systems that use more than one controller. It also allows local communication to a supervisor system, SMS communications and alert support.

MODBUS TCP/RTU GATEWAY



is used to connect one or more Modbus RTU devices to an Ethernet network. It can manage up to 32 RTU server (slave) devices. Various types of RTU devices can be freely mixed on the gateway output line. 3rd party Modbus data exchange for each TCP connection is supported. The Web Server feature allows data monitoring via Web browser.

MODULE RANGE

PWM CONVERTER



is a two channel, galvanically isolated from the DC power supply and from each other, PWM (pulse with modulation) to Current-Loop converter. Both channels are identical and independent, and can be freely used for AVR and/or Governor interface (or other application). It is possible using one PWM converter with two HT-GC500 controllers to control the power of the voltage on two different gensets.

DITEL



are I/O (input/output) modules used for HUEGLI TECH controllers expansion and as generic Modbus I/O expander. The base module has 16 digital inputs. Up to two output modules, each of 8 outputs can be attached to the base module.

DIPOT



(Digital Potentiometer) is a micro controlled electronic device, capable of generating a current loop output signal, up to +/- 20mA controlled by digital inputs, or remotely via Modbus RTU standard protocol (by use of internal RS485 interface).

It has different operation modes:

- stand-alone UP-DOWN to Current-Loop converter
- stand-alone voltage to Current-Loop converter and insulator
- ECU simulator: support J1939 protocol receiving Speed Reference that transfer to the governor by Current-Loop output; measures and transfer to the controller both OIL PRESSURE and COOLANT TEMPERATURE by means VDO sensors.

DITHERM



is an extension module with a thermocouple interfaces for 3 channels (supported thermocouples: B,R,S,J,E,N,K,T). The connection to the main controller is done via CAN-bus. It can also be interconnected to other DITHERM devices using RS485 Modbus RTU protocol.



DIGRIN



is a PT100 interface with 3 independent and galvanically isolated channels (temperature range -70°C $+650^{\circ}\text{C}$). The connection to the main controller is done via CAN-bus. It can also be interconnected to other DITHERM devices using RS485 Modbus RTU protocol.

DIVIT



is an analogue input module.

It has 4 configurable inputs, each for 0..5V, 0..10V, 0..10mA and 0..20mA (active or passive) inputs, and all are galvanically isolated.

CONTROLLERS FUNCTION OVERVIEW

Features	HT-GC310	HT-GC350	HT-GC500	HT-DST4602	HT-MC100
Graphic display (pixel)	128 x 64	128 x 64	128 x 64	240 x 128	128 x 64
Programmable Digital Input	8 + 3	18 + 3	18 + 3	20	18 + 3
Programmable Digital Output	5	15	15	14	18
Up to additional 16 digital inputs and 16 digital outputs (DITEL)	–	□	■	■	–
Frequency and power measurement of Mains input	■	■	■	■	■
True RMS readings on bus and mains voltage and currents	■	■	■	■	■
Additional current measurement for neutral or different protection	■	■	■	■	■
Active, Reactive and apparent power measurement for Mains	■	■	■	■	■
Real Time Clock (RTC)	■	■	■	■	■
Events and data logging	■	■	■	■	■
Engine speed measurement by pickup or Watt	■	■	■	■	–
Rate of Change of Frequency (df/dt, 81R ROCOF), Vector shift Protection	–	–	■	■	■
Parallel operation compatible with HT-DST4602, GC500 and MC 100	–	–	■	■	■
Three-phase AMF automatic genset controller with soft return	–	–	■	■	–
Built-In paralleling and load sharing for up to x gensets	–	–	16	24	–
Analogue synchronizing option allows easy integration into existing systems	–	–	■	■	–
Able to handle multiple mains incomers (1 unit per in-comer)	–	–	–	–	■
MCB and MGCB synchronization of multiple generators	–	–	–	–	■
Virtual Digital Inputs	–	–	–	■	–
RS232 interface port with Modbus RTU protocol	■	■	■	■	■
Additional RS232 or RS485 interface port	–	■	■	■	■
J1939 and MTU MDEC CAN interface	■	■	■	■	–
GSM and PSTN modem management	■	■	■	■	■
SMS communication	■	■	■	■	■
Split unit (Display and control unit)	–	–	–	□	–
Ethernet interface	–	□	□	□	□
PLC Functions including PID blocks	–	–	–	■	–

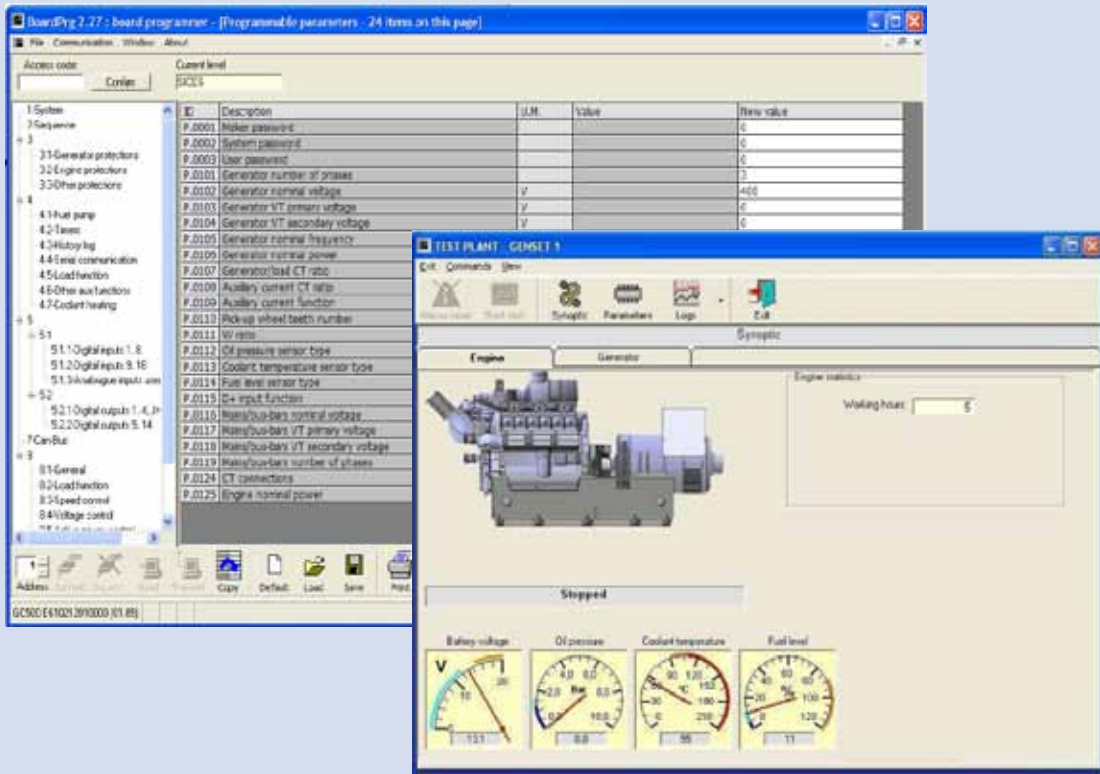
■ Standard □ Optional – Not Available



MODULES COMPATIBILITY

Conrtoller	CAN BRIDGE	ROUTER GMS	MODBUS TCP/RTU	PWM CONVERTER	DITEL	DIPOT	DITHERM	DIGRIN	DIVIT
HT-GC310	■	■	■	-	-	-	-	-	-
HT-GC350	■	■	■	-	-	-	-	-	-
HT-GC500	■	■	■	■	-	-	-	-	-
HT-DST4602	■	■	■	-	■	■	■	■	■
HT-MC100	■	■	■	-	-	-	-	-	-

■ Available - Not Available



BoardPrg,

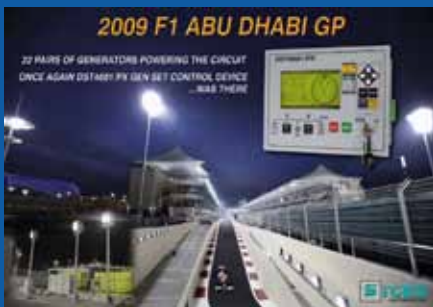
is a free software tool that allows full configuration of all HUEGLI TECH controllers. It is possible to save the parameters to a file and use it to clone other controllers for similar applications or spare parts. The parameter list can be printed for easy documentation. Updates of the BoardPrg can be easily done via internet. It is the recommended tool for the configuration of the controllers.

Supervisor,

is an easy to use PC software for panels and control systems equipped with HUEGLI TECH controllers. This software has been developed to provide customers with a simple and intuitive system of supervision; It allows to control all the parameters and the measurement features of single gensets or a complete the system. Supervisor is a completely configurable system and allows the customer to create and manage the configuration of many details of his plant. Each plant can be fully independent from the others.



REFERENCE APPLICATIONS



Location: F1 Abu Dhabi GP

The Abu Dhabi GP, added to the F1 calendar in 2009, runs through the desert sunset and finishes in complete darkness. Here the cars can exceed 300 kph three times on every lap. This circuit is lit by 22 pairs of gensets controlled by 44 x DST4601/PXs (the forerunner of DST4602).
 DST4601/PX - When failure is not an option.



Location: Greek island

Many of us like spending vacations on a Greek Island. Sitting in the dark with a candle on the table might be romantic, but without electricity most of us wouldn't be happy at all. Several plants, producing the needed power, running in island parallel mode and also in parallel to the grid, are equipped with control panels containing DST4601/PX + DICHRON module, ensure that you will not sit in the dark (except when you want to).
 (e.g. Gensets with Mitsubishi engines: 4 x 1285kW, 5 x 1285kW, 2 x 1285kW)



Location: F1 Singapore GP

In Singapore, 20+ F1 racing cars sprint between 23 bends on 5km of public roads, between concrete walls and over 2 bridges for up to 2 hrs with speeds peaking just short of 300 kmh – in the dark! As F1 cars have no headlights, they rely 100% on the specially erected floodlights to see where they are going. The floodlights, in turn, rely 100% on the power from 12 pairs of gensets. Since this first ever floodlit F1 race was run in 2008, these gensets have been controlled by 24 x DST4601/PX controllers.

REFERENCE APPLICATIONS



Location: Batam Indonesia

In the Government Building LAM are 2 Perkins Gensets each with 250 kVA running in parallel, controlled by 2 HT-GC500 controllers.



Location: University from Misurata, Libya

Professors and Students are happy being able to study not in dark rooms. The university building is supplied by 3 gensets running in parallel, controlled by DST4601/PX with DICHRON module.



Location: Bio oil refinery in Italy

7 bio fuel Mitsubishi engines, each with 1175 kVA, are running in parallel on a Combined Heat and Power plant. The control panels are quipped with DST4601/PX controller with DICHRON modul.





Location: Singapore

In March 2011, Neste Oil celebrated the grand opening of its ISCC-certified renewable diesel plant in Singapore. The plant produces premium quality NExBTL renewable diesel, what is the most advanced fuel on the market today. For emergency power (with back synchronization to the mains) they use 2 Mitsubishi engines with each 1260 kVA. With the DST4601/PX with DICHRON modules they can run the gensets in island parallel and parallel to the mains.

REFERENCE APPLICATIONS



Location: Marsa Alam, Egypt

Vacation on the Red Sea with uninterrupted power? The public mains not always stable and available in this region but you can enjoy your stay at the 3 resorts of Settemari and Floriana Hotel Group in Marsa Alam. A famous tourist destination where a plant of 11 generator sets are ready to feed the resort and guarantee uninterrupted energy. The Caterpillar engines (385 – 600 kVA) are controlled by DST4601/PX with DICHRON modules, giving the needed security of 24h power availability.

Location: Fréjus, France

On the Côte d'Azur uninterrupted power is needed to supply energy for a purification water plant for Fréjus. The two 1250kVA gensets can run in island mode or parallel to the grid. The control panel consists 2 DST4601/PX controllers with DICHRON modules and one MC100 unit for controlling the Mains Circuit Breaker for soft return and avoiding any interruption when mains returns.

Location: Petrobras construction site in Caraguatatuba, Brazil

Petrobras is one of the biggest energy companies in the world. For their production power plant they are using 6 MTU engines each with 1000kVA running in parallel. Petrobras chose to use control panels from SICES equipped with DST4601/PX and DICHRON modules.



SUPPORT & TRAINING



HUEGLI TECH Training Centre

for combustion engine controls & governing systems with helpful theory - practical live demonstrations on our own test engines.

Product range

- HT-GC310
- HT-GC350
- HT-GC500
- HT-DST4602
- HT-MC100
- Accessoires

Application modes

- Theory and live – Comprehensive demonstrations
- Genset control only
- A.M.F. applications
- Single Stand-By application (SSB)
- Single Parallel Island application (SPI) – (island or with mains)
- Single Parallel to Mains (SPtM)
- Multiple sets in island operation (MINT)
- Multiple sets with mains
- Power Management with the MAINS (importing and exporting)

Accessories

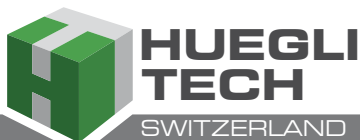
Monitoring and Configuration
Remote monitoring
Special PC SW

The products described in this publication are subject to revision or improvement at any time. Catalogue descriptions and details, such as technical and operational data, drawings, diagrams and instructions, etc., do not have any contractual value. In addition, products should be installed and used by qualified personnel and in compliance with the applicable local regulations in force in order to avoid damage and safety hazards.

*due to pre-existing agreements not all products are available in every country



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Solution Provider for:

- Gas Management Systems
- Dual Fuel Conversion Systems
- Governing Systems
- Automation Systems
- Engine Protection
- Starting Solutions
- Battery Care
- Oil Treatment and Recycling
- Thermostatic Control Valves

HUEGLI TECH are active directly or through agents in:

EUROPE

AUSTRIA, BALTIC STATES, BELGIUM, DENMARK, EIRE, FAEROE ISLAND, FINNLAND, FRANCE, GERMANY, GREECE, GREENLAND, ICELAND, ITALY, MOLDAVIA, NETHERLANDS, NORWAY, POLAND, RUMANIA, RUSSIA, SPAIN, SWEDEN, SWITZERLAND, UNITED KINGDOM, TURKEY.

FAR EAST AND AUSTRALIA

AUSTRALIA, BANGLADESH, CAMBODIA, CHINA, HONG KONG, INDIA, INDONESIA, JAPAN, KOREA, LAOS MIANMAR, MALAYSIA, NEW ZEALAND, PHILIPPINES, SINGAPORE, TAIWAN, THAILAND, VIETNAM.

MIDDLE EAST AND AFRICA

ALGERIA, EGYPT, IRAN, IRAQ, ISRAEL, LEBANON, SYRIA AND NIGERIA, PAKISTAN, SAUDI ARABIA, TUNESIA, UNITED ARAB EMIRATES.

NORTH AMERICA

USA, CANADA.