InteliGen^{NT}, InteliSys^{NT} ®

Operator Guide

IG-NT, IG-NTC, IG-NT-BB, IG-NTC-BB, IS-NT-BB, IS-NTC-BB,
IM-NT, IM-NT-BB, IM-NTC-BB

ComAp

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Table of Contents

General guidelines

This manual provides general information on how to operate the IG/IS-NT controller via InteliVision 5, InteliVision 8, IS-Display or from the front panel of InteliGen^{NT} GC or InteliMains^{NT} GC. *This manual is intended for everybody who is concerned with operation and maintenance of the gen-set.*

Description of the controller system

NT family controllers are comprehensive AMF-controllers for single and multiple generating sets operating in stand-by or parallel modes. Synchronizer, isochronous load sharer, Mains and Generator protections allow for a total integrated solution for gen-sets in stand-by and parallel modes with multiple engine support.

NT family controllers (IG-NT, IG-NTC, IG-NT-BB, IG-NTC-BB, IS-NT-BB, IS-NTC-BB, IM-NT, IM-NT-BB and IM-NTC-BB) could be equipped with a powerful colour display showing icons, symbols and bar-graphs for intuitive operation, which sets, together with high functionality, new standards in gen-set controls.

The controller automatically starts the gen-set, closes the gen-set C.B. when all conditions are met, then stops the engine on external signal or by pressing push buttons.

Parallel to Mains operation can be achieved without additional HW. Forward and reverse synchronizing, Mains protection including vector shift, load and power factor control, earth fault protection are the major functions provided. Interfacing to foreign synchronizers and load sharers is supported.

The key feature of NT family controllers is their easy-to-use installation and operation. Predefined configurations for typical applications are available as well as user-defined configurations for special applications.

Conformity declaration

CE   Following described machine complies with the appropriate basic safety and health requirement of the EC Low Voltage Directive 2006/95/EC and EC Electromagnetic Compatibility Directive 2004/108/EEC based on its design and type, as brought into circulation by us.

Note:
ComAp believes that all information provided herein is correct and reliable and reserves the right to update at any time. ComAp does not assume any responsibility for its use unless otherwise expressly undertaken.

!! Warnings !!

Be aware that the binary outputs can change state during and after software reprogramming (before the controller is used again ensure that the proper configuration and setpoint settings are set in the controller)!!!

Be aware that gen-set can automatically or remotely start when following controller terminals are disconnected !!!

- Mains voltage measuring   and / or
- Binary outputs for MCB control   and / or
- MCB feedback

Switch InteliGen^NT to OFF mode and disconnect the Binary outputs Starter and Fuel to avoid unexpected automatic start of gen-set and GCB closing.

!!! CAUTION !!!

Dangerous voltage

In no case touch the terminals for voltage and current measurement!
Always properly connect grounding terminals!

Take care when disconnecting In/Im3 terminals when the gen-set is stopped.
For safety connect parallel to controller In/Im3 terminals two anti parallel diodes 10A/100V.

In any case do not disconnect generator CT terminals when the gen-set is loaded.

Adjust set points

All setpoints are preadjusted to their typical values. But the setpoints in the "**Basic settings**" settings group **!!must!!** be adjusted before the first startup of the gen-set.

**!!! WRONG ADJUSTMENT OF BASIC PARAMETERS
CAN DESTROY THE GEN-SET !!!**

Available related documentation

PDF files	Description
IGS-NT-SPTM-3.0 Reference Guide.pdf	General description of SPtM applications for InteliGen NT and InteliSys NT. Contains description of engine and generator control, control of power in parallel to mains operation, list of all Setpoints, Values, Logical Binary Inputs and Logical Binary Output.
IGS-NT-SPI-3.0 Reference Guide.pdf	General description of SPI applications for InteliGen NT and InteliSys NT. Contains description of engine and generator control, control of power in parallel to mains operation, list of all Setpoints, Values, Logical Binary Inputs and Logical Binary Output.
IGS-NT-MINT-3.0 Reference Guide.pdf	General description of MINT applications for InteliGen NT and InteliSys NT. Contains description of engine and generator control, powermanagement, list of all Setpoints, Values, Logical Binary Inputs and Logical Binary Output.
IGS-NT-Combi-3.0 Reference Guide.pdf	General description of Combi applications for InteliGen NT and InteliSys NT. Contains description of engine, and generator control in SPTM, SPI and MINT mode, powermanagement, list of all Setpoints, Values, Logical Binary Inputs and Logical Binary Output.
IGS-NT-COX-3.0 Reference Guide.pdf	General description of COX applications for InteliGen NT and InteliSys NT. Contains description of engine and generator control, powermanagement, list of all Setpoints, Values, Logical Binary Inputs and Logical Binary Output.
IGS-NT Application Guide 05-2013.pdf	Applications of InteliGen NT, InteliSys NT and InteliMains NT, examples of connection, description of PLC functions, Virtual and Shared peripheries.
IGS-NT Operator Guide 05-2013.pdf	Operator Guide for all hardware variation of InteliGen NT and InteliSys NT, InteliVision 5 and InteliVision 8.
IGS-NT Installation Guide 05-2013.pdf	Thorough description of installation and technical information about InteliGen NT, InteliSys NT and InteliMains NT and related accessories.
IGS-NT Communication Guide 05-2013.pdf	Thorough description of connectivity and communication for InteliGen NT, InteliSys NT and InteliMains NT and related accessories.
IGS-NT Troubleshooting Guide 05-2013.pdf	How to solve most common troubles with InteliGen NT and InteliSys NT controllers. Including the list of alarm massages.
IGS-NT & ID-DCU Accessory Modules 05-2013.pdf	Thorough description of accessory modules for IGS-NT family, technical data, information about installation of the modules, how to connect them to controller and set them properly.

InteliVision 5
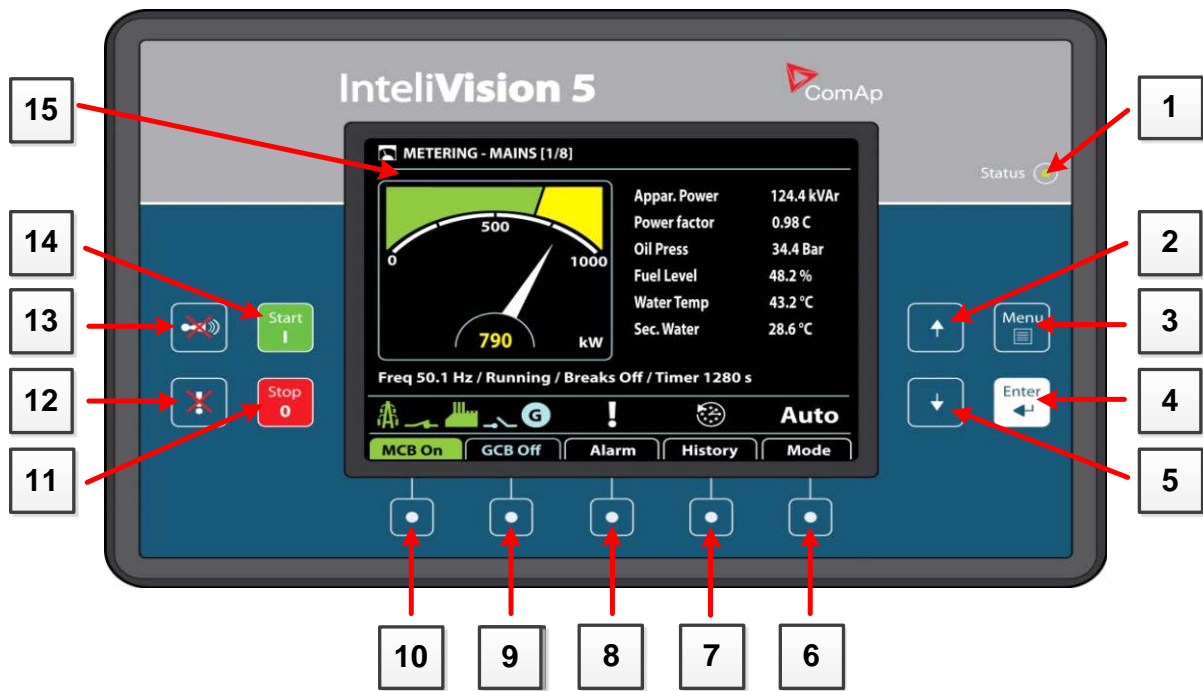
INTELIVISION 5 INDICATION

POSITION	DESCRIPTION
1	Status LED indication. The InteliVision 5 is running.

DISPLAY AND CONTROL BUTTONS

POSITION	BUTTON	DESCRIPTION
2		**Up** button. Use this button to move up, scroll up the screens or increase a value.
3		**Menu** button. Use this button to switch to menu subpages. See Pages Structure chapter below this table for more details.
4		*Enter* button. Use this button to enter item from the list, menu, or confirm a value.
5		**Down** button. Use this button to move down, scroll down the screens or decrease a value.
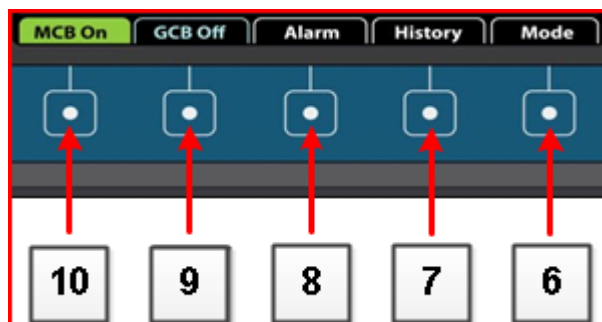
Context sensitive Buttons

Position	Indicator Description
6	**Mode** button**.** Use this button to call mode change.*
7	**History** button. Use this button to call controller history screen.*
8	**Alarm** list button**.** Use this button to enter Alarm list.*
9	**GCB** button. Works in MAN mode only. Press this button to open or close the GCB manually. Note that certain conditions must be valid otherwise GCB closing is blocked.*
10	**MCB** button. Works in MAN mode only. Press this button to open or close the MCB manually.* **Caution!** You can disconnect the load from the mains supply with this button! Be sure you know well what you are about to do!

* - It is valid in default configuration only. Screens description and buttons 6 to 10 could have different meaning in customized versions or SW branches.

Gen-set Control Buttons and Display

| Position	Button	Description
11	Stop 0	**Stop** button. Works in MAN and SEM mode only. Press this button to initiate the stop sequence of the gen-set. Repeated pressing or holding the button for more than 2s will cancel current phase of stop sequence (like ramping the power down or cooling) and next phase will continue.
12		**Fault reset** button. Use this button to acknowledge alarms and deactivate the horn output. Inactive alarms will disappear immediately and status of active alarms will be changed to "confirmed" so they will disappear as soon as their reasons dismiss.
13		**Horn rest** button. Use this button to deactivate the horn output without acknowledging the alarms.
14	Start I	**Start** button. Works in MAN and SEM mode only. Press this button to initiate the start sequence of the engine.
15		Colour display, 320x240 pixels.

Page Structure

Display Screens and Pages Structure

The displayed information is structured into "pages" and "screens".
1. The pages Metering consists of screens which displays measured values like voltages, current, oil pressure etc., computed values like i.e. gen-set power, statistic data and etc.. Use arrows Up and Down buttons to switch over the pages.
2. The Setpoints screen contains all setpoints organized to groups and also a special group for entering password.
3. The History screen shows the history log in the order that the last record is displayed first.
4. Help/Others screen allows set-up languages, user access, InteliVision 5 setting and etc..
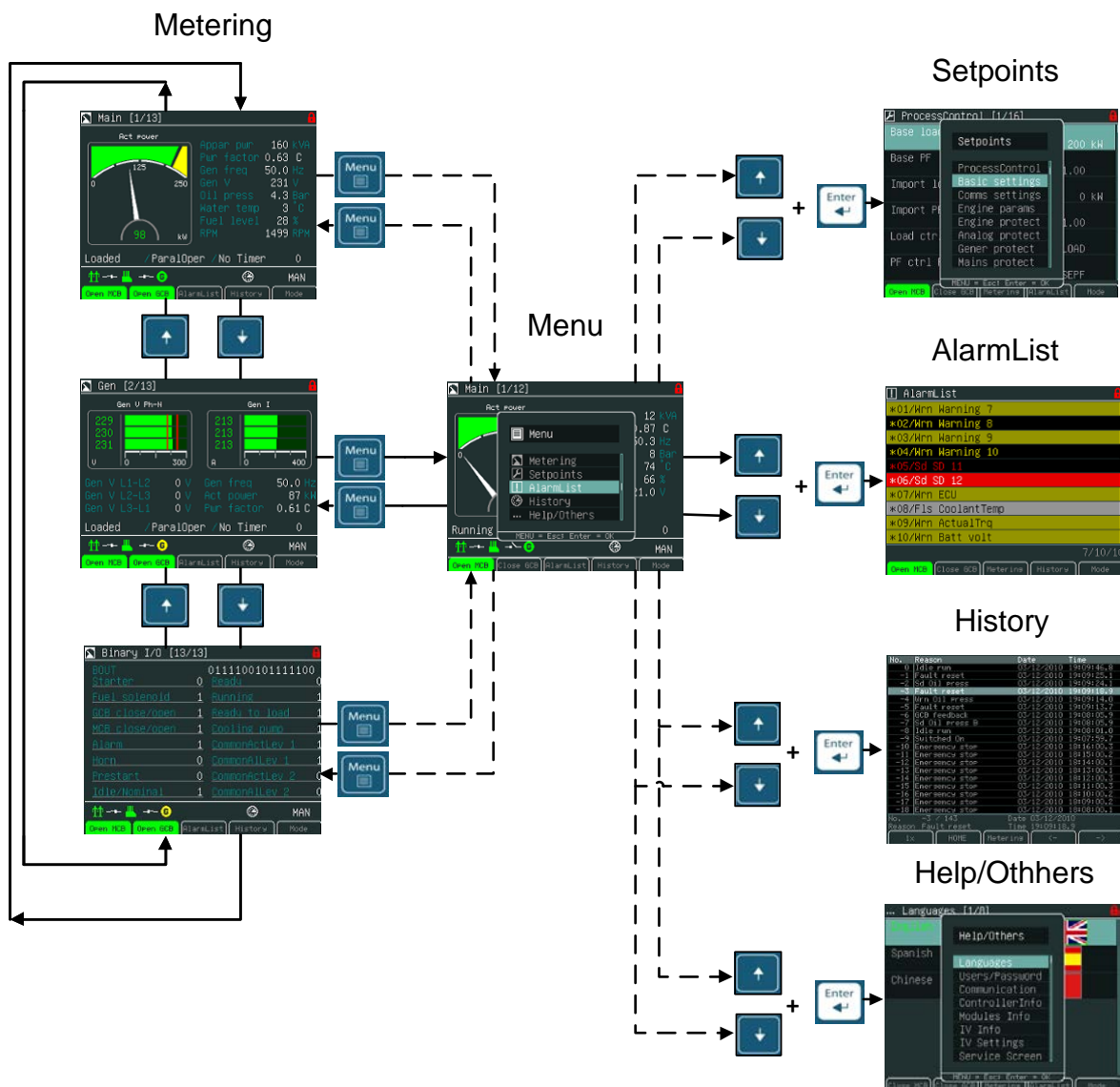
Connection
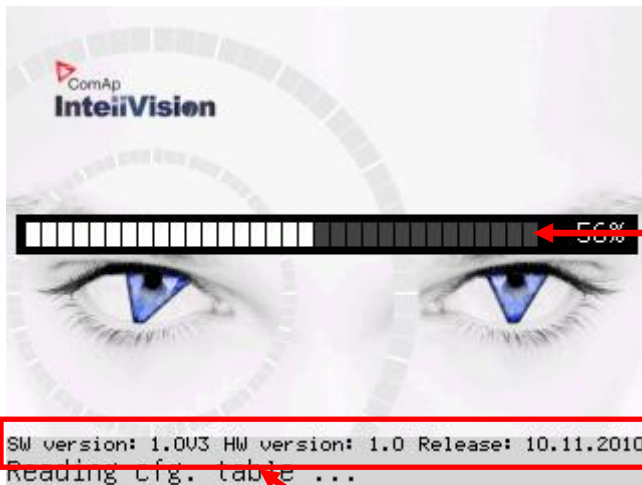
Configuration reading

InteliVision 5 information SW, HW version and release date

Alarms

Alarms are structured into two levels and inteliVision 5 allows easy interpreted their meaning based on the colour scheme. First level alarm (yellow lamp, warnings) is interpreted with yellow colour ⟍●. Red colour ⟍● is used for all second level alarms (Red lamp, ShutDown,…). When an error occurs, a new alarm appears in the AlarmList screen, exclamation mark starts blinking on the metering screens.
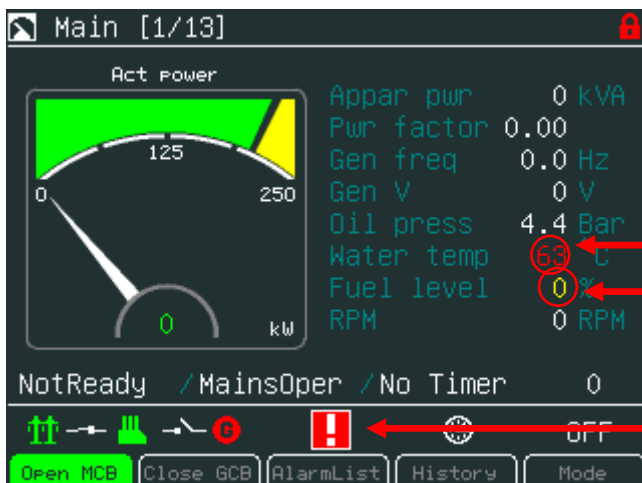
Second level alarm

First level alarm

Alarm indication

Direct button to AlarmList

Hint:

When a new alarm appears AlarmList screen is displayed automatically when the main/first Metering screen is displayed. From different screen, Alarm button has to be used to display AlarmList screen.

AlarmList Screen

AlarmList screen	
⚠ AlarmList 🔒	
*01/Wrn Warning 7	Active unacknowledged first level alarm
*02/Wrn Warning 8	Inactive unacknowledged first level alarm
*03/Wrn Warning 9	
*04/Wrn Warning 10	
*05/Sd SD 11	Inactive unacknowledged second level alarm
*06/Sd SD 12	Active unacknowledged second level alarm
*07/Wrn ECU	
*08/Fls CoolantTemp	Active ECU alarm
*09/Wrn ActualTrq	
*10/Wrn Batt volt	
(7) (10) (10)	Sum of all alarms
Open MCB Close GCB Metering History Mode	Sum of unacknowledged active and inactive alarms
	Number of active alarms

Alarm activated with analogue value

Analog Inputs [11/13] 🔒	
Oil press Water temp Fuel level Sec Wtemp	
Bar °C % °C	
4.4 63 44 63	
10.0 150 100 200	Second level alarm
3.0 60/50 10 50	First level alarm
1.0 0 0 0	
0.0	
Shutdown /MainsOper /Stop time 58	
⚙ ! ⏱ MAN	
Open MCB Close GCB AlarmList History Mode	

Alarm activated with binary inputs

Binary I/O [12/13] 🔒	
BIN 0101001100000000	
GCB feedback 0 Warning 9 0	
MCB feedback 1 Warning 10 0	
Remote S/S 0 SD 11 0	
Emergency stop 1 SD 12 0	
AccessLock int 0 SD 13 0	
Remote OFF 0 SD 14 0	
Warning 7 1 SD 15	First level alarm
ShutDown 1 SD 16 0	Second level alarm
⚙ OFF	
Open MCB Close GCB AlarmList History Mode	

Setpoint Change
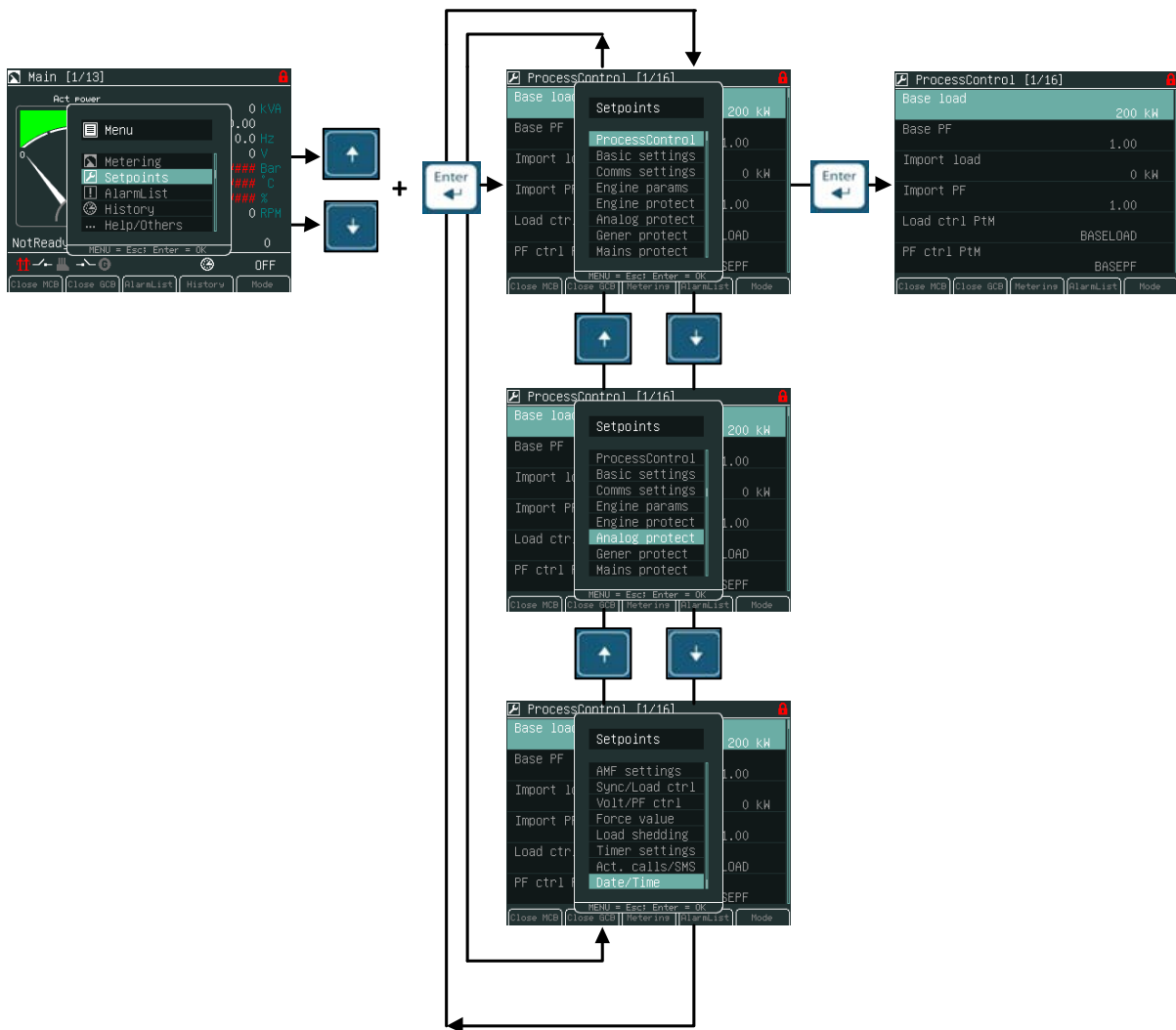
Hint:
Setpoints marked with a padlock icon 🔒 are password protected. **Enter** password as described in the chapter Entering the Password below.

Entering the Password

Locked Display and Setpoints

Display is locked, no user is logged in
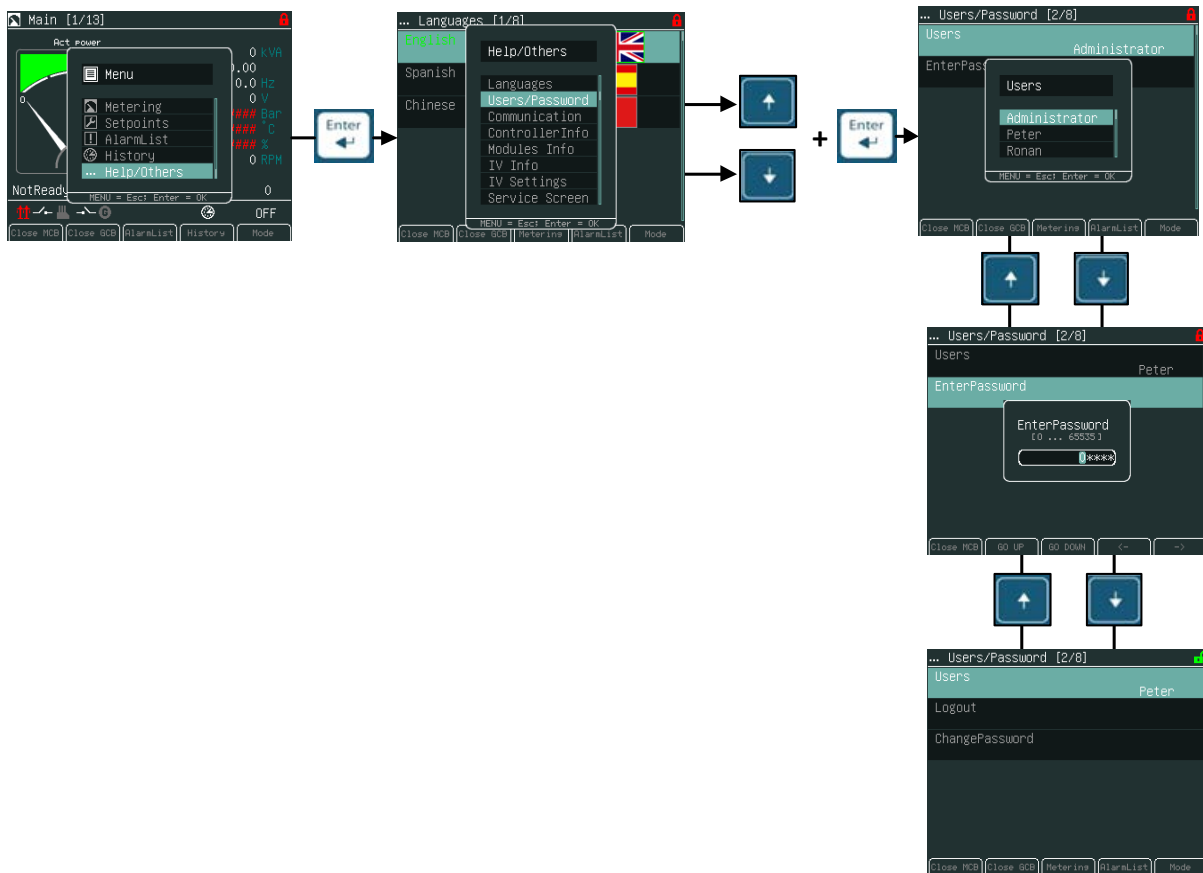
Locked setpoint

Hint:

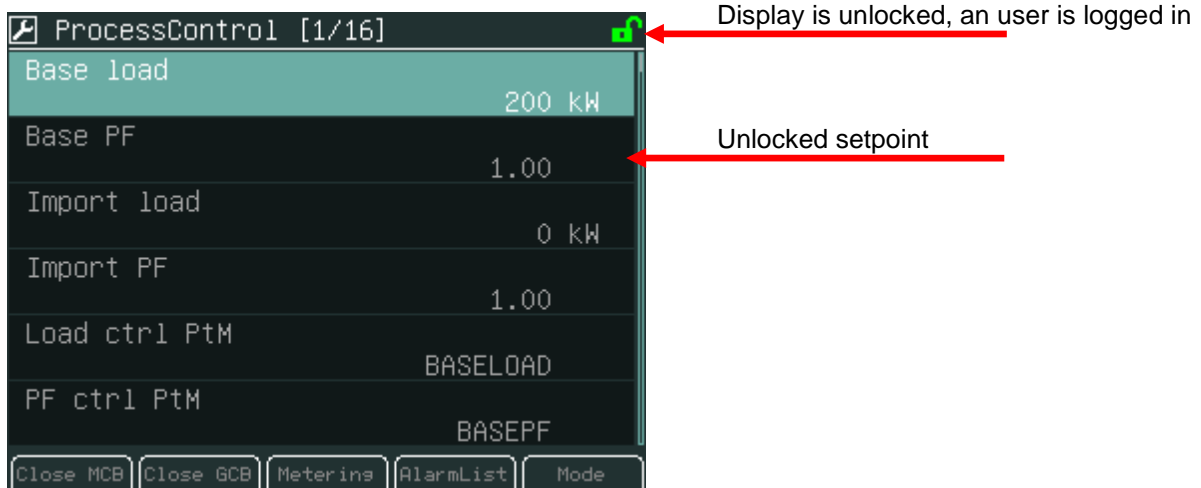Log in? Password dialog has to be open and then use → or ← for position and for the field use ↑ or ↓.

Password is a five-digit number (0 - 65535). Only setpoints associated with the entered password level can be modified. Display is locked automatically when no action is done within 15 minutes.

Unlocked Display and Setpoints

Display is unlocked, an user is logged in

Unlocked setpoint

For setpoints change use arrows ↑ or ↓ to go to a certain setpoint (e.g. Base load) and press *Enter* button, see pictures below:

Numeric Setpoint Change

Actual setpoint value

Min ... Max value

Actual cursor position

Cursor position - Arrow right

Cursor position - Arrow left
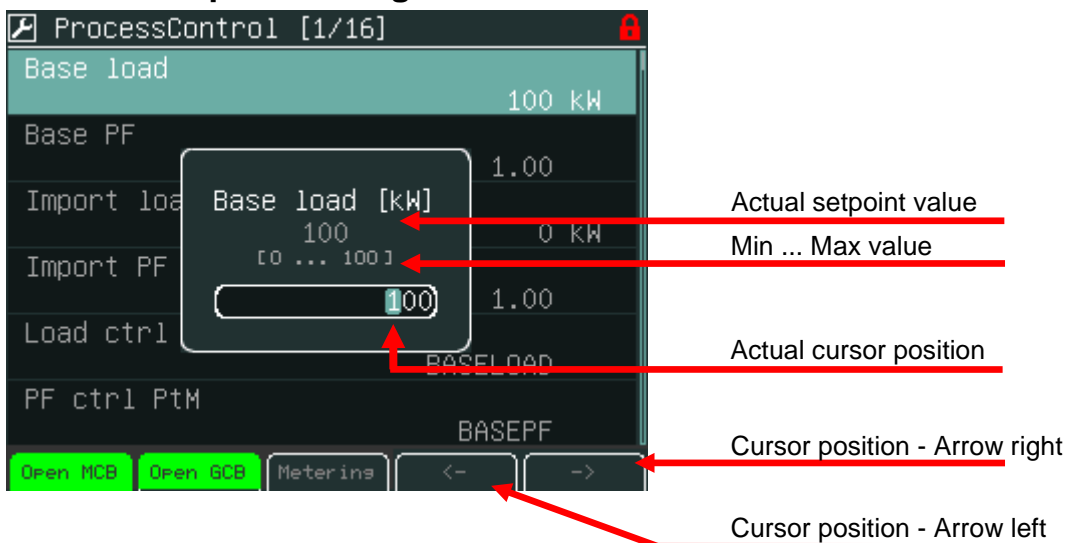
Use → or ← buttons to go to a certain position of the field and use ↑ or ↓ buttons to change the value. Then use **Enter** button to confirm new value.

Hint:
If you set the value out of limit, the field will get red colour and the new value is invalid. Invalid value cannot be confirmed.

String Selection

Actual setpoints group

Sum of the setpoints group

Actual setpoint value

Direct button to the last Metering screen
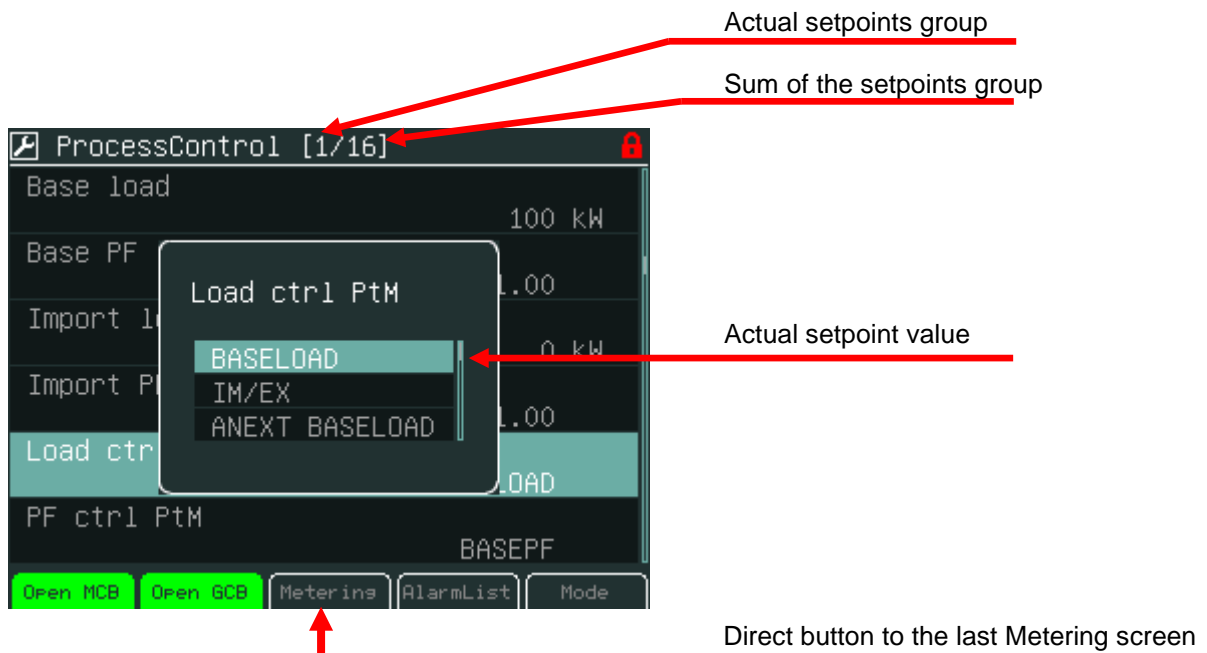
Use ↑ or ↓ buttons to select the string from the list and press the **Enter** button.

String Edit

Actual position in characters list

Cursor position - Arrow right

Cursor position - Arrow left

Numbers / lower case / upper case

Insert space / character

Remove space / character
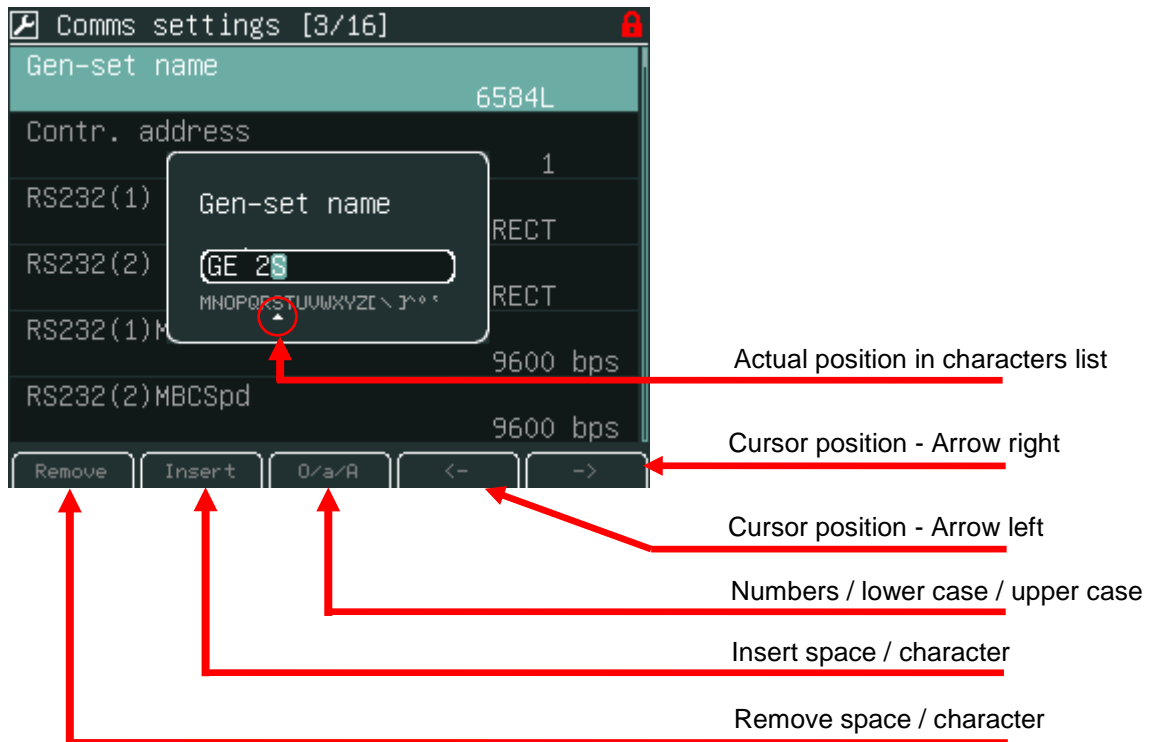
Use ↑ or ↓ buttons to select the character and → ← buttons for the next position and press **Enter** button.

Time and Date Edit

```
⚙ Date/Time [16/16]                    🔒
Time stamp act
                    ENGINE RUNNING
Time stamp per
                            1 min
#SummerTim       #Time          ABLED
#Time          ( 23:40:30 )     40:30
#Date
                    29/11/2010

Open MCB   Open GCB  Metering   <-      ->
```

Scroll bar shows cursor position on the current screen

Cursor position - Arrow right

Cursor position - Arrow left
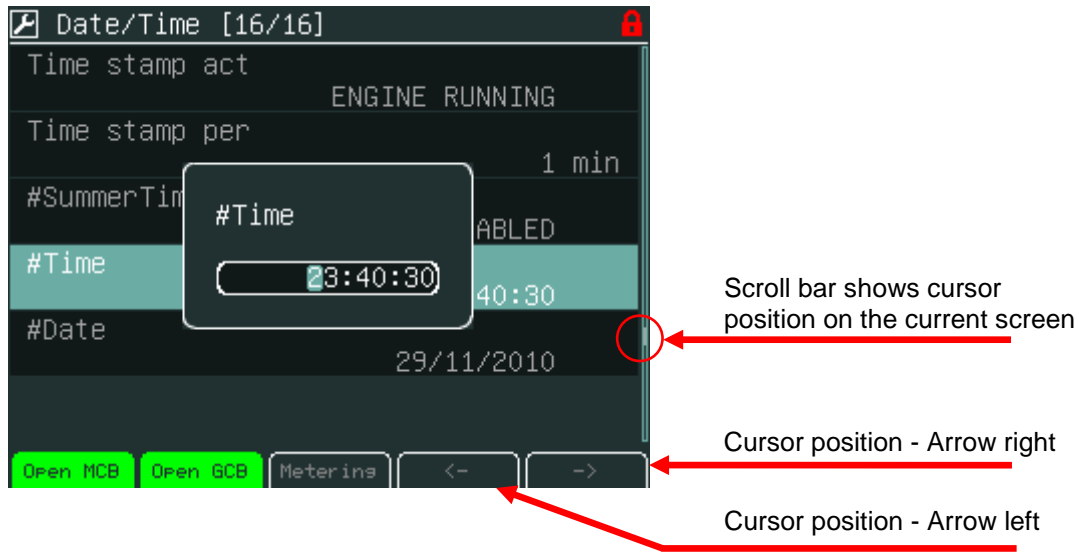
Use ↑↓ buttons to select the number, → ← for the next position and press **Enter** button.

Combined Setpoints

```
⚙ ProcessControl [1/16]               🔒
PF ctrl PtM
                            BASEPF
I/E-Pm m    PeakAutS/S del [s]    PUT
I/E-Qm m          OFF            PUT
            [ 1 ... 3200 ]
PeakLeve  ( OFF            )
                            0 kW
PeakLeve  (          0001  )
                            0 kW
PeakAutS/S del
                        OFF s
Open MCB   GO UP   GO DOWN   <-      ->
```

Actual setpoint value

Cursor position - Arrow right

Cursor position - Arrow left
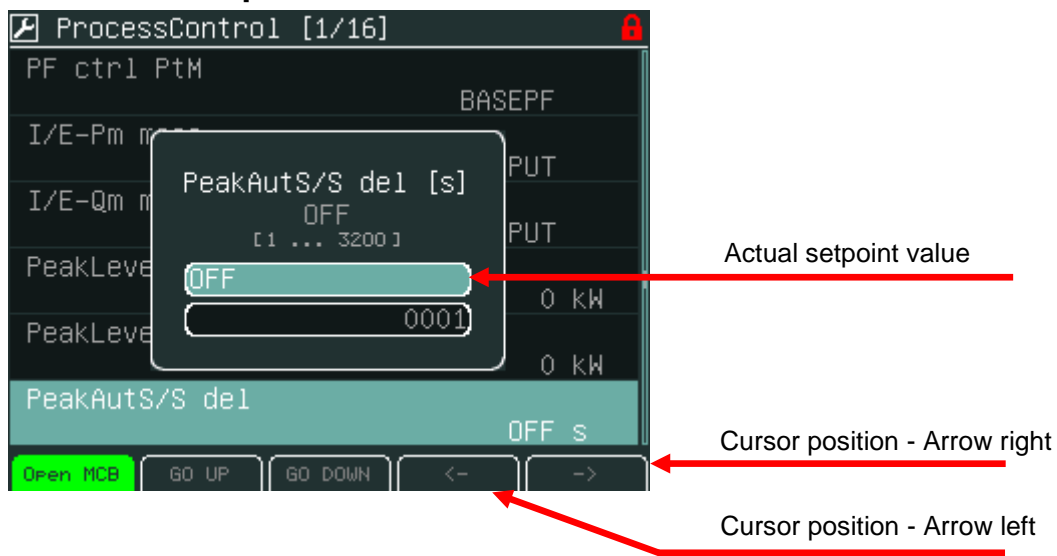
Use ↑ or ↓ buttons to select the number, → or ← for the next position or go **Up** or go **Down** context buttons and press **Enter** button.

History

History page

Scroll history log - Arrow left

Scroll history log - Arrow right

Direct button to the last Metering screen

Direct button to the first position / or column
In the history log
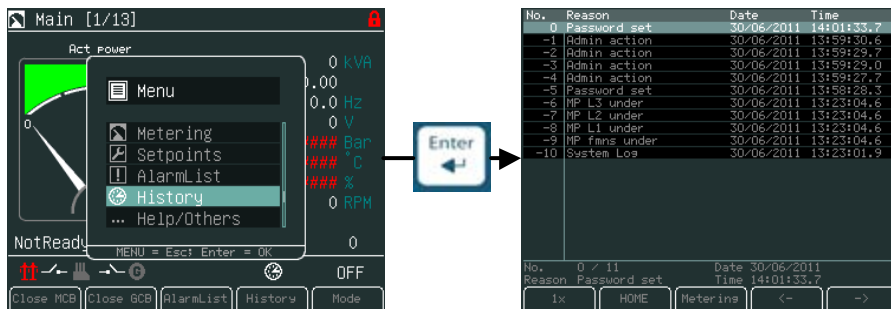
Page scroll (1x, 1x Page, 10x Page)
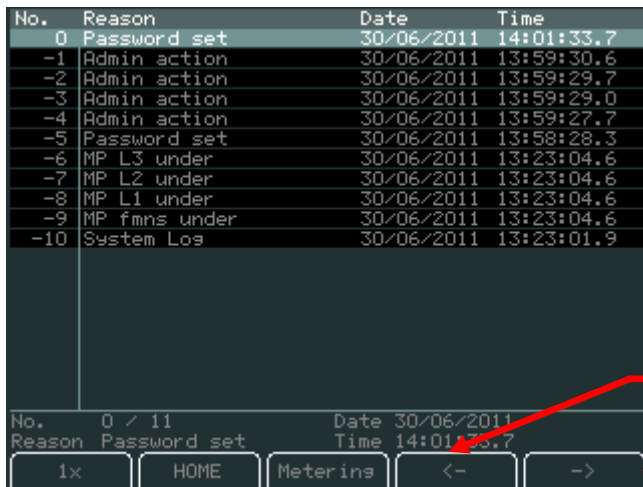
Display Contrast Adjustment

Display brightness could be set from the keyboard with button combination Menu button and ↑ or ↓.

Hold

Press

Or press
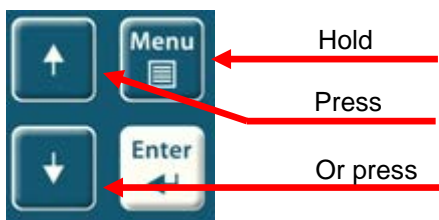
Two modes for backlight could be used day or night mode. Hold Menu button until the day or night pictogram appears.
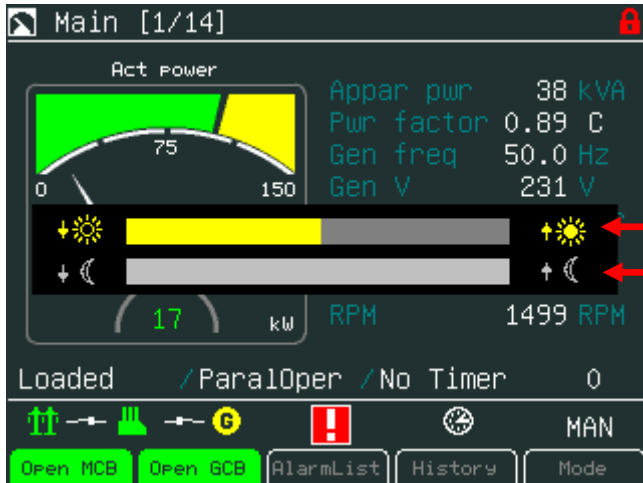
Day mode - active

Night mode - inactive

Hint:
Display backlight could be switched off due to Backlight Time. For recovery any button has to be pressed. (see IV5 Settings).

Controller Information Screen

Hint:
Lost password? Display the information screen containing the serial number and password decode number as described in the picture bellow and send them to your local distributor.
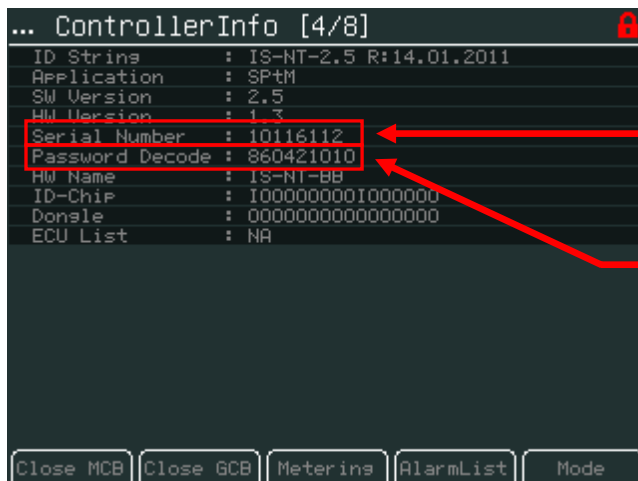
Serial number

Password decode

InteliVision 8

DIRECT BUTTONS (GROUP 1)
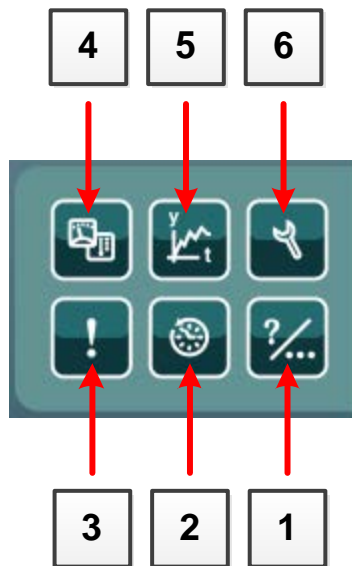
POSITION	BUTTON	DESCRIPTION
1		**Help/Others -** settings and information (users/passwords, communication, languages, InteliVision 8 and controller info, InteliVision 8 settings)
2		**History** button. Use this button to call controller history.
3		**Alarm** list button. Use this button to enter AlarmList.
4		**Measurement** button**.** Display actual values (power, synchro, analog. inputs, binary I/O, cylinders, engines, etc.)
5		**Trends** button. Use this button to go to the trends screen where chosen values in graphs/real time trends are displayed.
6		**Setpoints** button. Use to go to the setpoints group screen.

CONTEXT SENSITIVE BUTTONS (GROUP 2)
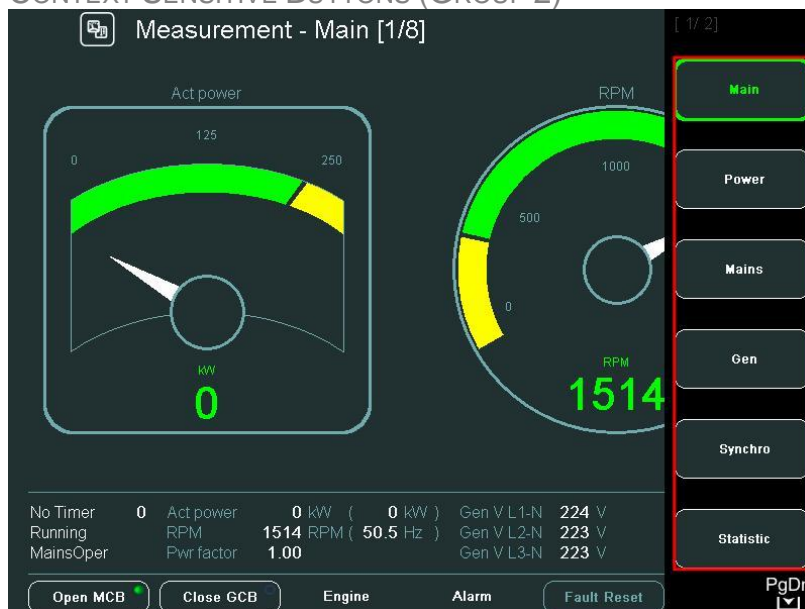
The context sensitive buttons allow display predefined screens when a suitable button is pressed. Meaning of the buttons depends on the Main menu option that is currently displayed (Metering, Trends and etc.) and on the controller firmware. The Picture above introduces standard SW IGS-NT-2.5.

Navigation Buttons

There are nine navigation buttons:
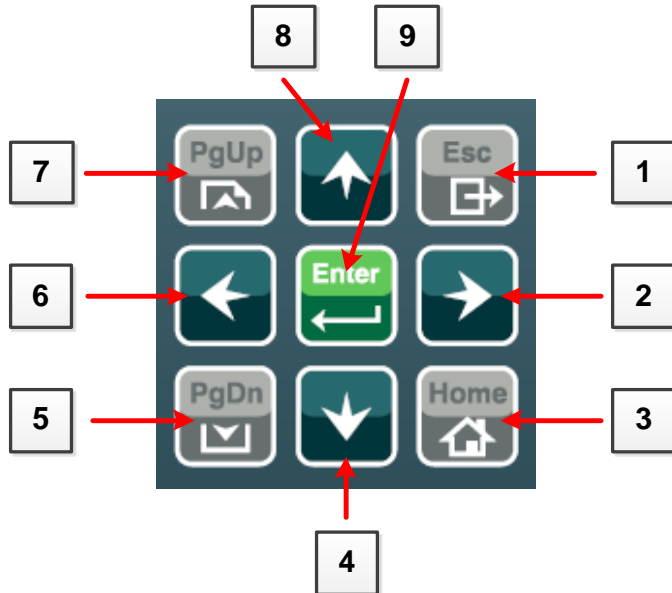
Position	Button	Description
1	Esc	**ESC** button. Escape from any dialog window or menu (cancels an action).
2	→	**Right** button. Use this button to move the cursor to the right, scroll to the right history page and etc.
3	Home	**Home** button. Jump to Home screen. Main Metering screen is used in default configuration.
4	↓	**Down** button. Use this button to move down, scroll down the screens or decrease a value.
5	PgDn	**PgDn** button. Use this button to quickly go down among Metering screens or Setpoints groups (when menu is active) or among Setpoints or History records (when menu is not active).
6	←	**Left** button. Use this button to move the cursor to the left, scroll to the left history page and etc.
7	PgUp	**PgUp** button. Use this button to quickly go up among Metering screens or Setpoints groups (when menu is active) or among Setpoints or History records (when menu is not active).

8	⬆	**Up** button. Use this button to move up, scroll up the screens or increase a value.
9	Enter	**Enter** button. Use this button to confirm a value or opens a value adjustment within setting dialogs.

Hint:

To leave the context menu, use Esc, **Enter** or ↑ ↓ → ← buttons.

GEN-SET CONTROL BUTTONS

POSITION	BUTTON	DESCRIPTION
4	Stop 0	**STOP** button. Works in MAN mode only. Press this button to initiate the stop sequence of the gen-set. Repeated pressing or holding the button for more than 2s will cancel current phase of stop sequence (like ramping the power down or cooling) and next phase will continue.
5	Start I	**START** button. Works in MAN mode only. Press this button to initiate the start sequence of the engine (MAN and SEM mode only).
6	📡	**HORN RESET** button. Use this button to deactivate the horn output without acknowledging the alarms.

POSITION	BUTTON	DESCRIPTION
8		**Mode button**. Use this button to call mode change.*
9		**Fault reset** button. Use this button to acknowledge alarms and deactivate the horn output. Inactive alarms will disappear immediately and status of active alarms will be changed to "confirmed" so they will disappear as soon as their reasons dismiss.*
12		**GCB** button. Works in MAN mode only. Press this button to open or close the GCB manually. Note that certain conditions must be valid otherwise GCB closing is blocked.*
13		**MCB** button. Works in MAN mode only. Press this button to open or close the MCB manually.* <u>CAUTION!</u> You can disconnect the load from the mains supply with this button! Be sure you know well what you are about to do!
14		Colour display, 800x600 pixels.

* - It is valid in default SPtM configuration only. Screens description and buttons from 8 to 13 could have different meaning in customized versions or SW branches.

INTELIVISION 8 LED INDICATION

POSITION	DESCRIPTION
7	**POWER** indication. LED diode turns on when InteliVision 8 is powered up.
10	**Alarm** indication. Alarm LED indication indicate alarms. Yellow colour for the first level alarms and red colour for the second level alarms. <u>*Hint*</u>: LED diode blink when at least one acknowledge alarm is present in the Alarm List. LED diode lights when alarms were acknowledged but are still active.
11	**Engine** indication. Engine LED indication lights only when engine is running.

<u>*Hint:*</u>
When you switch on InteliVision 8 display, *Power* LED turns on and *Engine* and *Alarm* LEDs start to blink for a while.
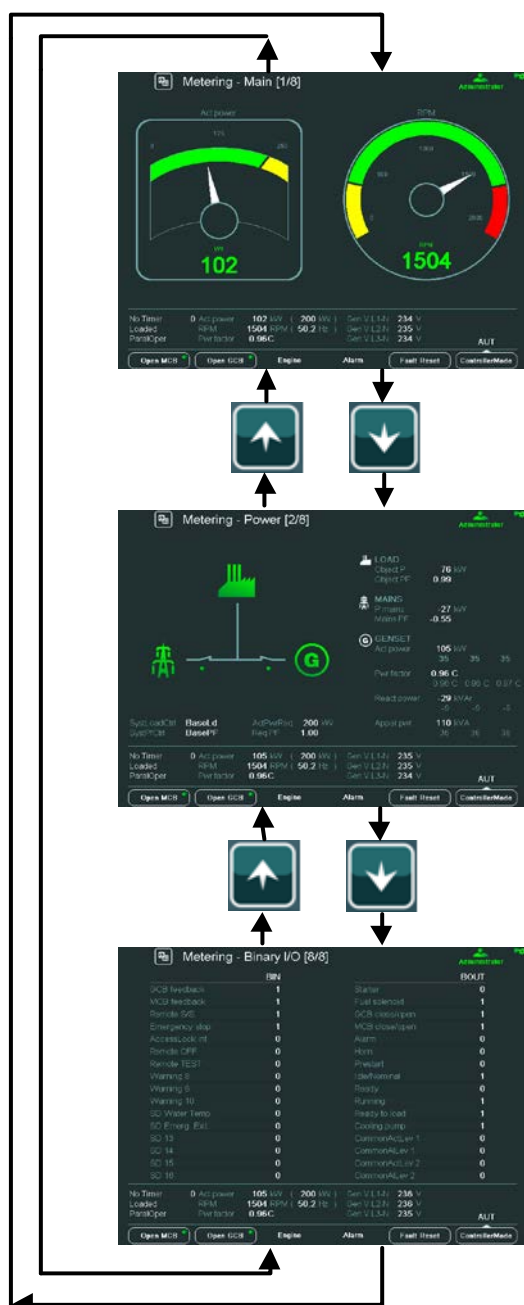
Page Structure

Display Screens and Pages Structure

The displayed information is structured into "pages" and "screens".
1. The pages Metering consists from pages which displays measured values like voltages, current, oil pressure etc., computed values like i.e. gen-set power, statistic data and etc.. Use arrows Up and Down buttons to switch over the pages.
2. The Setpoints screen contains all setpoints organized into the groups and also a special group for entering password.
3. The History screen shows the history log in the order that the last record is displayed first.

Metering pages structure

Connection

Configuration reading

SW Version: 1.2.5
HW Version: 1.1
Release Date: 04.02.2011
Serial Number: 101005A4
Core Version: 1.2.5.1 (01.03.2011) CM-X300-CE6
IVCom SW Version: 1.3

InteliVision 8 core information

Configuration reading.

Serial number and release date

InteliVision 8 SW and HW version

InteliVision 8 is not connected
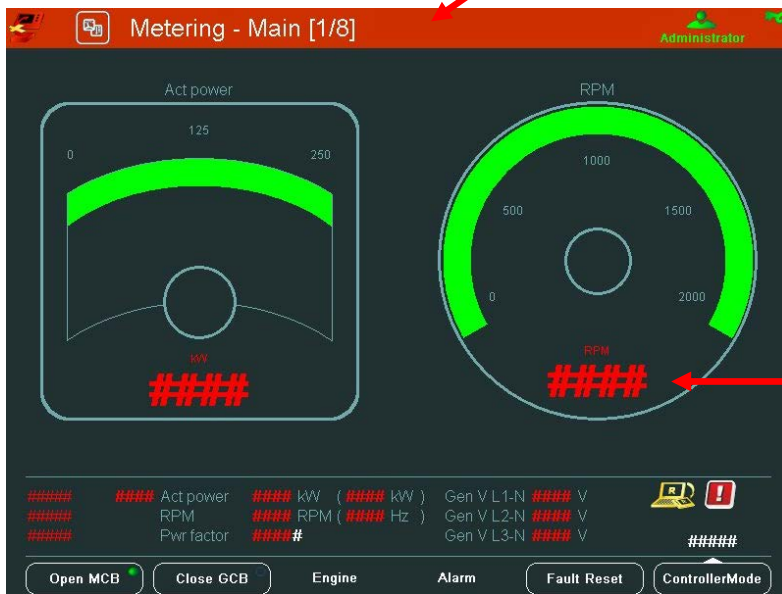
Not available value

Reloaded configuration
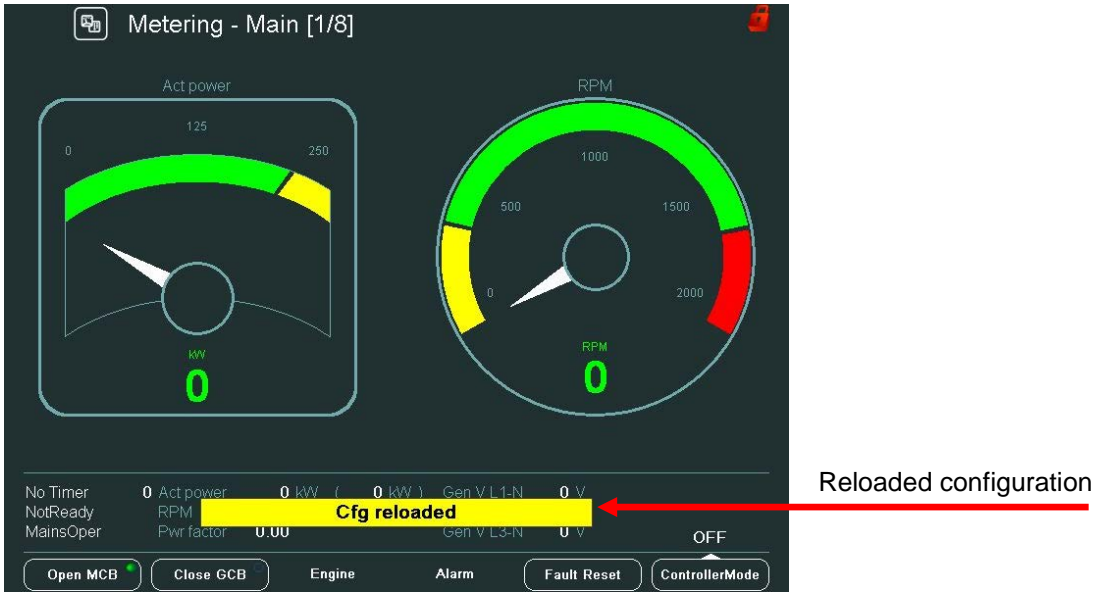
Alarms

Alarms are structured into two levels and InteliVision 8 allows easy interpreted their meaning based on the colour scheme. When an error occurs, a new alarm appears in the **AlarmList** screen, exclamation mark starts blinking on the metering screens. When all alarms are acknowledged, the exclamation stops blinking and is on.
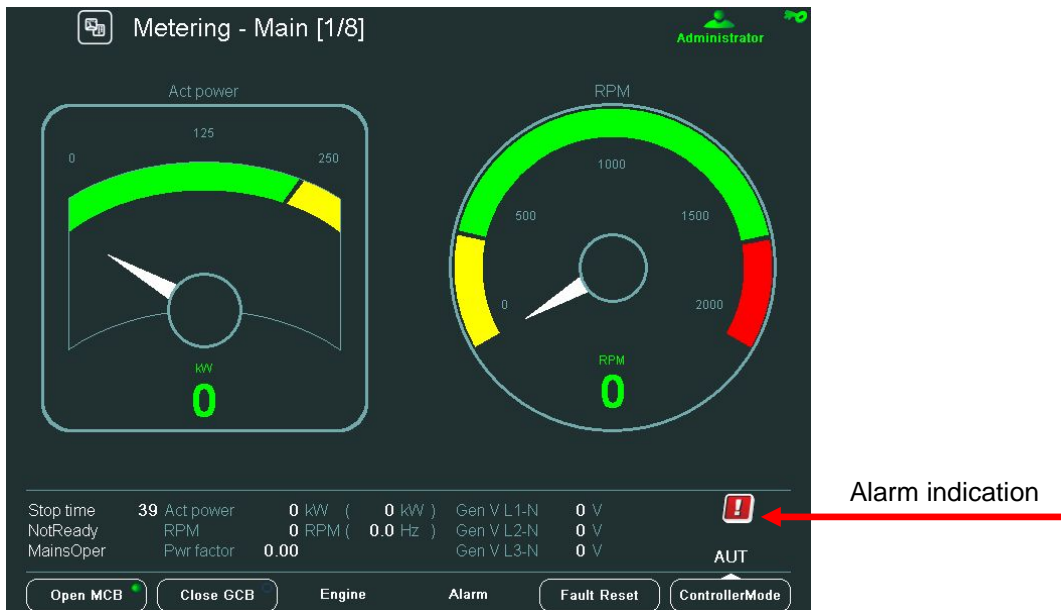
Alarm indication

Hint:

When a new alarm appears **AlarmList** screen is displayed automatically when the main/first Metering screen is displayed. From different screen, **AlarmList** button has to be used to display **AlarmList** screen.

AlarmList Screen

Active acknowledged alarm

Active unacknowledged alarm

Inactive unacknowledged alarm

Sum of all alarms

Sum of unacknowledged alarms

Number of active alarms

Hint:
Use **Fault** reset button to confirm alarm in the **AlarmList**.

First level alarm

Second level alarm

Second level alarm

First level alarm

Setpoint Change

On Setpoints screens you can set various setpoints. To go to Setpoints screen press **Setpoints** button. Setpoints screen appears with the context sensitive buttons for the the setpoints group.

Order of the setpoints group

Sum of the setpoints group

Setpoints Group

User Access Level

Locked setpoint

Hint:

Content of the context buttons list depends on the type of the application. To be more familiar with setpoints, see Reference Guide of the specific application (e.g.IGS-NT-SPTM-2.5-Reference Guide.pdf or IGS-NT-MINT-2.5-Reference Guide.pdf).

Change of the Numerical Value

Use →, ← buttons to go to a certain position of the field and use ↑↓ to change the value. Then confirm your settings with **Enter** button.

Hint:
If the value is out of limit, the field will color red and the value could not be confirmed.
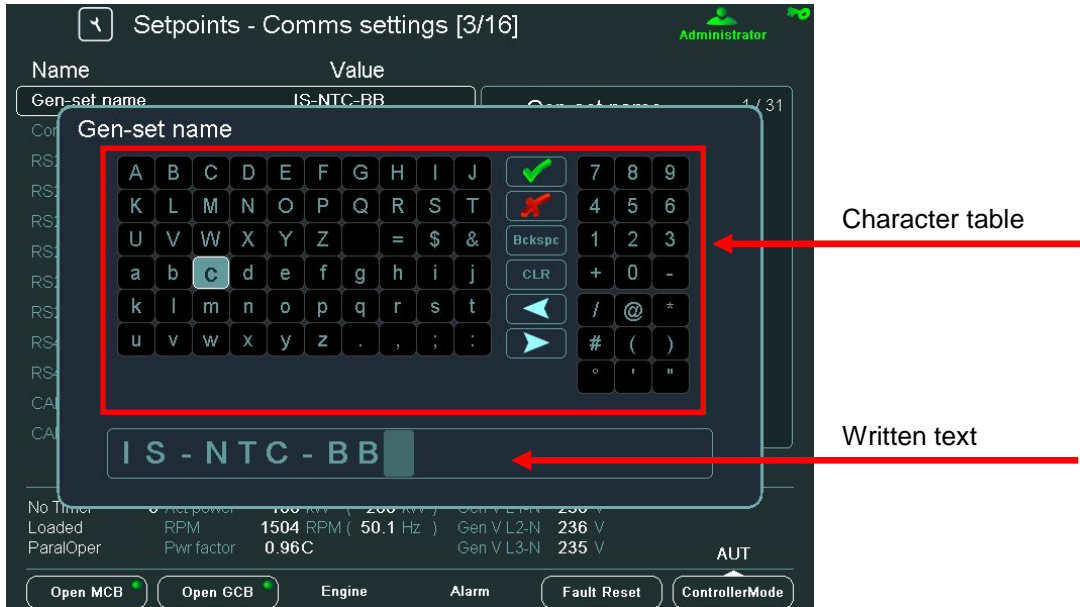

Edited setpoint

Actual setpoint value

Cursor position

Max. value

Min. value
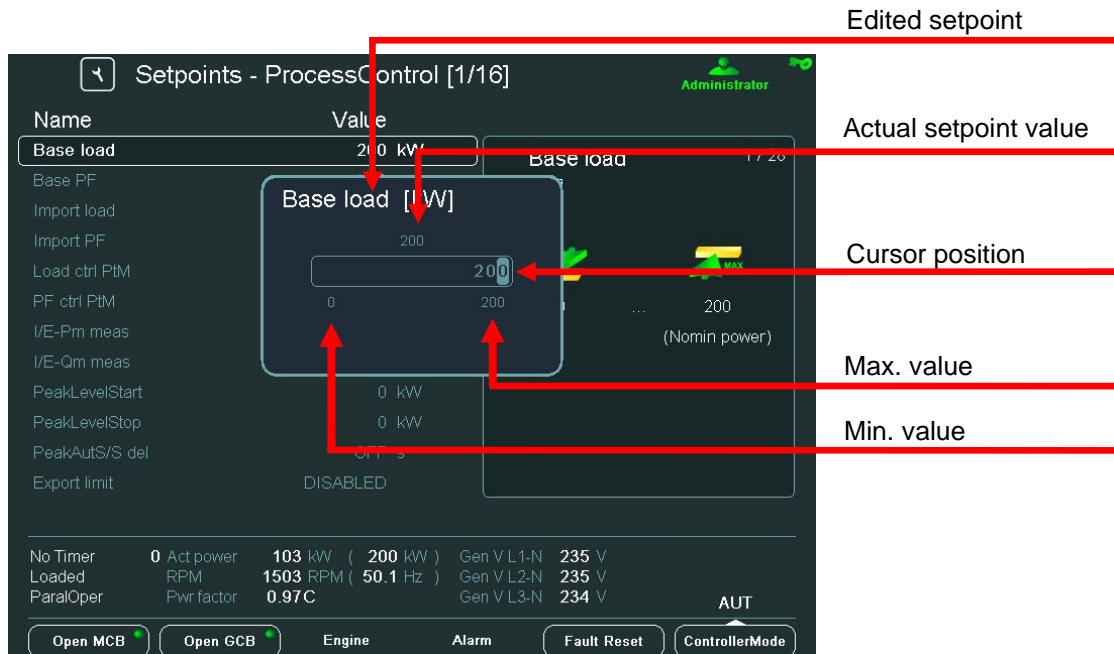
String Selection

Use ↑↓ to go to a certain setpoint and press **Enter**, see picture below:

Administrator signed in

Actual setpoint value
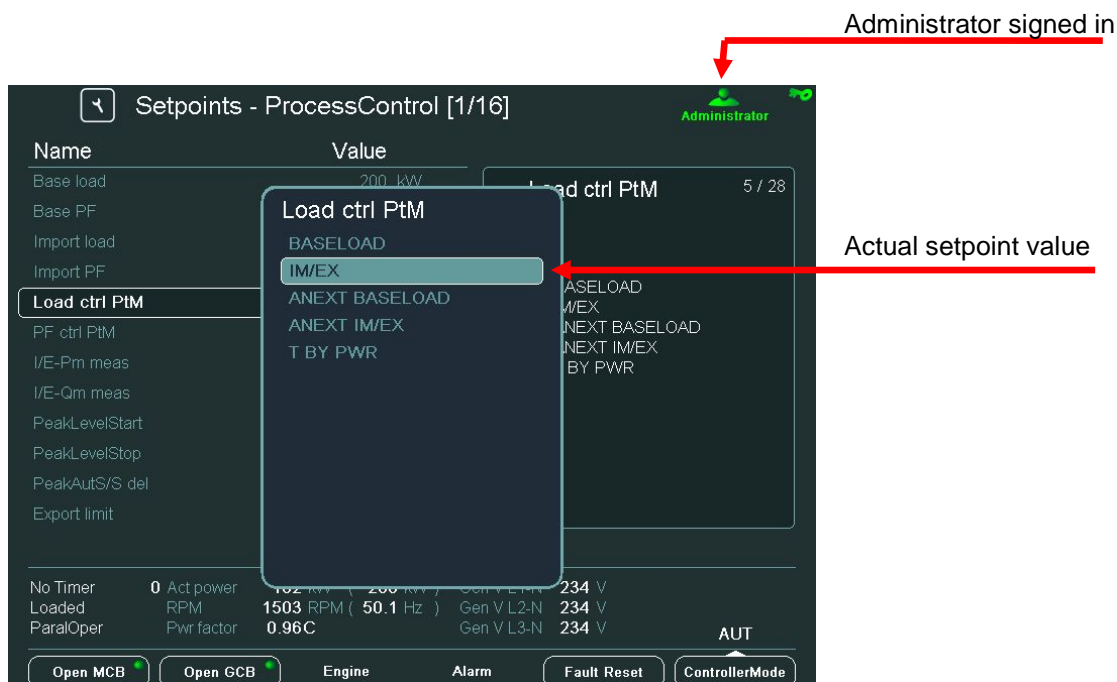
String Edit

The characters set table appears on the screen when string will be edited (like gen-set name). Use → ← and ↑ ↓ to find the position, then press [✓] button to confirm text.

Character table

Written text

Time and Date Edit

Date and Time are edited as the numerical value. See *Change of the Numerical Value*.

Setpoint

Cursor position

Combined Setpoints

Use Left or Right buttons to move between the cells. Use Left or Right arrow to change cursor position.

Entering the password

User has to be logged in before setpoint is changed. Use **Help/Others** button to open login dialogue, then use ↑↓ to go to **Users** field and **Password** then press **Enter**.

Hint:
Password is a five-digit number (0 - 65535). Only setpoints associated with the entered password level can be modified.

Administrator signed in
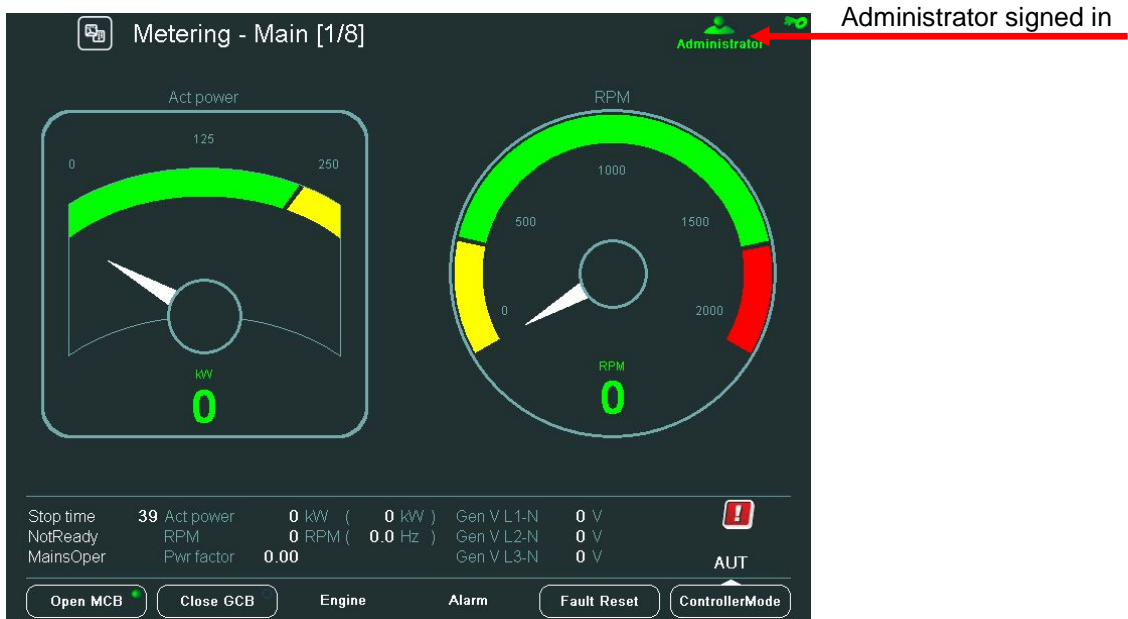
The icons in the top right-hand corner then show you that you are logged on.

History

Displayed values in columns

1
2
3
4
5

Actual line (row) with the appropriate values in the history log

POSITION	DESCRIPTION
1	**First Row/Col**. Use to jump to the first column and first row (the first column is **RPM** – you cannot move among columns **Reason**, **Date** and **Time**)
2	**First Row**. Use to jump to the first row.
3	**First Col**. Use to jump to the first column.
4	**Last Col**. Use to jump to the last column.
5	**PageMode On**. Use this button when the PageMode is ON you can use → ← buttons to jump by page right or left (quicker movement through columns). Icon at the top of the screen indicates that PageMode is On.

Display Contrast Adjustment

From the mains screen the day or night mode can be choose. The mode is switched when ESC button is pressed for one second. The brightness is adjustable in the full range of 0 % - 100 % in the both modes. The display brightness can be increased/decreased by holding **Esc** button and repeated pressing ↑↓. See picture below:

Hold

Press

Or press

Day mode - active

Night mode - inactive
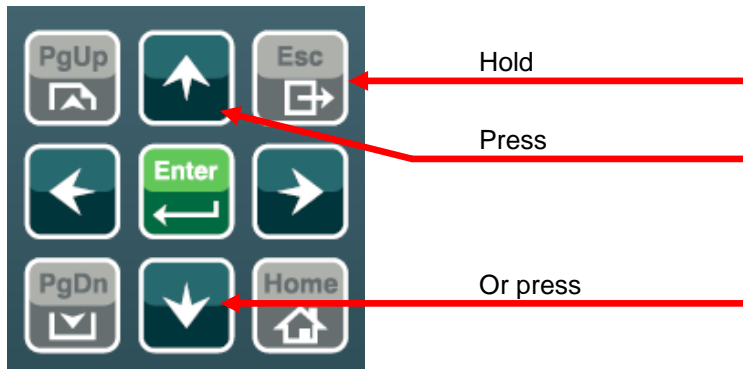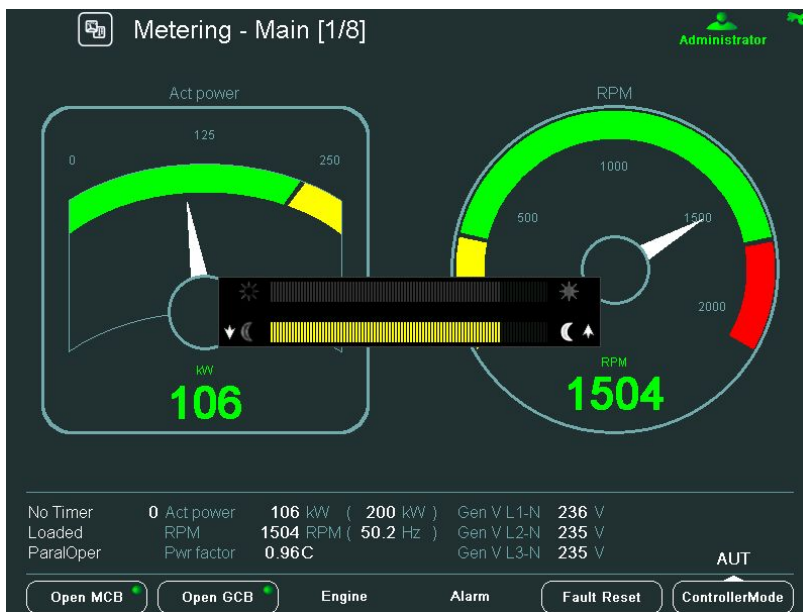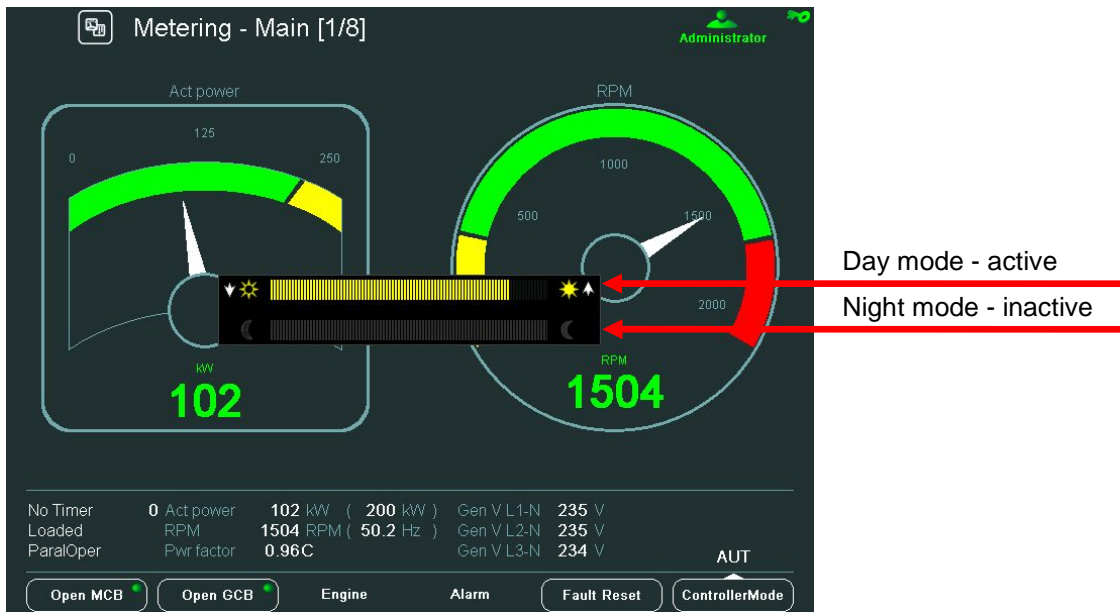
When brightness dialogue is active, use **ESC + PgUp** buttons or **ESC + PgDn** to switch between modes, which shall be adjusted.

Hold

Press

Or press

Controller Information Screen

Control unit serial number

InteliVision 8 SW verison

InteliVision 8 SN

Supported languages

InteliGen^{NT} GC and InteliSys^{NT}

InteliGenNTGC pushbuttons and LEDs
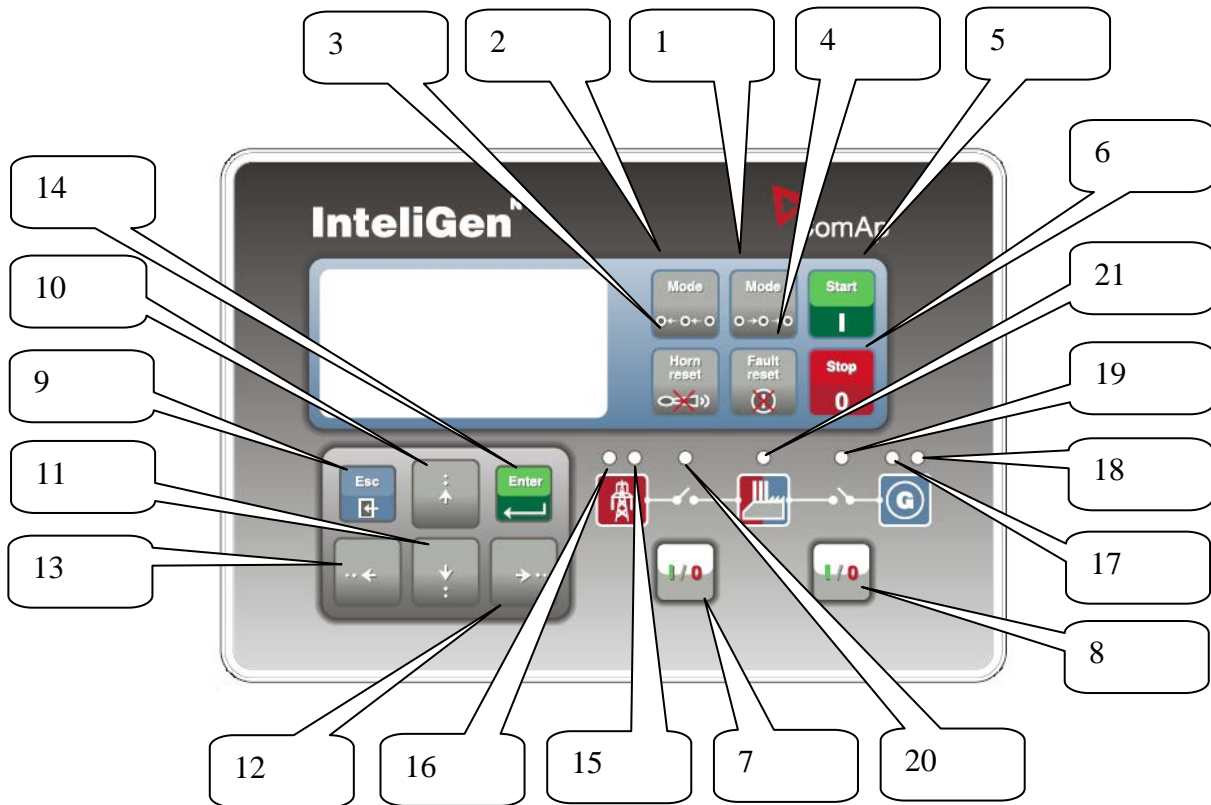
Pushbuttons:

1. MODE→ Cycle forward through gen-set operation modes OFF→MAN→ AUT→ TEST.
2. ←MODE Cycle backward through gen-set operation modes OFF←MAN ←AUT←TEST.
3. HORN RESET Deactivates the HORN (AUDIBLE ALARM).
4. FAULT RESET Acknowledges faults and alarms.
5. START   Starts the gen-set in MAN mode.
6. STOP   Stops the gen-set in MAN mode.
7. MCB ON/OFF   Opens and closes (synchronizes) the Mains circuit breaker in MAN mode.
8. GCB ON/OFF   Opens and closes (synchronizes) the Generator circuit breaker in MAN mode.
9. ESC

Where	Function
Measurement screens, Alarm list	Go to Menu screen
Setpoints screen	Go to Menu screen; within setpoint

	group, go to group list
Setpoint edit	Leave setpoint edit without changes
History screen	Go to Menu screen
FastEdit screen	Fast edit exit (to previous measurement screen) without changes
Language screen	Language screen exit (to menu) without save

10. ⬆ Select the setpoint, select the screen, select history record or increase setpoint value.
11. ⬇ Select the setpoint, select the screen, select history record or decrease setpoint value.
12. ➡ Moves history record displayed columns to the right, 5% increase of edited setpoint's value (step given by the setpoint range), go back from Alarm list.
13. ⬅ Moves history record displayed columns to the left, 5% decrease of edited setpoint's value (step given by the setpoint range), view Alarm list from measurement screens.
14. ENTER

Where	Function
Menu screen	Go to selected display group (Measurement CU, Measurement IO, …)
Measurement screens, Alarm list	Go to FastEdit screen (hold ENTER for 4 sec.) – then it is possible to adjust selected setpoint (typically Base load for standard SPtM)
Setpoints screen	Go to selected setpoint group
Setpoint edit	Start setpoint edit / save changes
History screen	Go to the first column of the first history record
FastEdit screen	FastEdit exit (to previous measurement screen) with setpoint change
Language screen	Language screen exit (to menu) and save selection

Pushbuttons'combinations

Following table determines controller functions when ⬆, ⬇, ⬅, ➡, ENTER and PAGE buttons' combination is pressed:

Where	Pushbutton combination	Function
Measurement screens, Alarm list	ENTER + ⬆ ENTER + ⬇ ENTER + ESC	Contrast increase Contrast decrease Info screen
Info screen	ENTER + ⬆ ENTER + ⬇	Backlight increase Backlight decrease

LEDs

15. MAINS VOLTAGE PRESENT: GREEN LED is on, if voltage on the mains terminals is present (in SPI and SPtM). LED is not active in MINT, COX.

16. MAINS FAILURE: RED LED starts flashing when the mains failure occurs and gen-set does not run, goes to steady light when the gen-set starts and goes off when the mains restores.
17. GEN VOLTAGE PRESENT: GREEN LED is on, if gen. voltage is present and within limits.
18. GEN-SET FAILURE: RED LED starts flashing when any failure occurs. After FAULT RESET button is pressed, goes to steady light (if an alarm is still active) or is off (if no alarm is active).
19. GCB ON: GREEN LED is on, if GCB feedback is active. Flashes during synchronizing.
20. MCB ON: GREEN LED is on, if MCB feedback is active. Flashes during reverse synchronizing (synchronizing of the loaded gen-set back to the restored mains).
21. Bus – GREEN LED is on if bus voltage is present and within limits.

InteliSysNT Basebox pushbuttons and LEDs
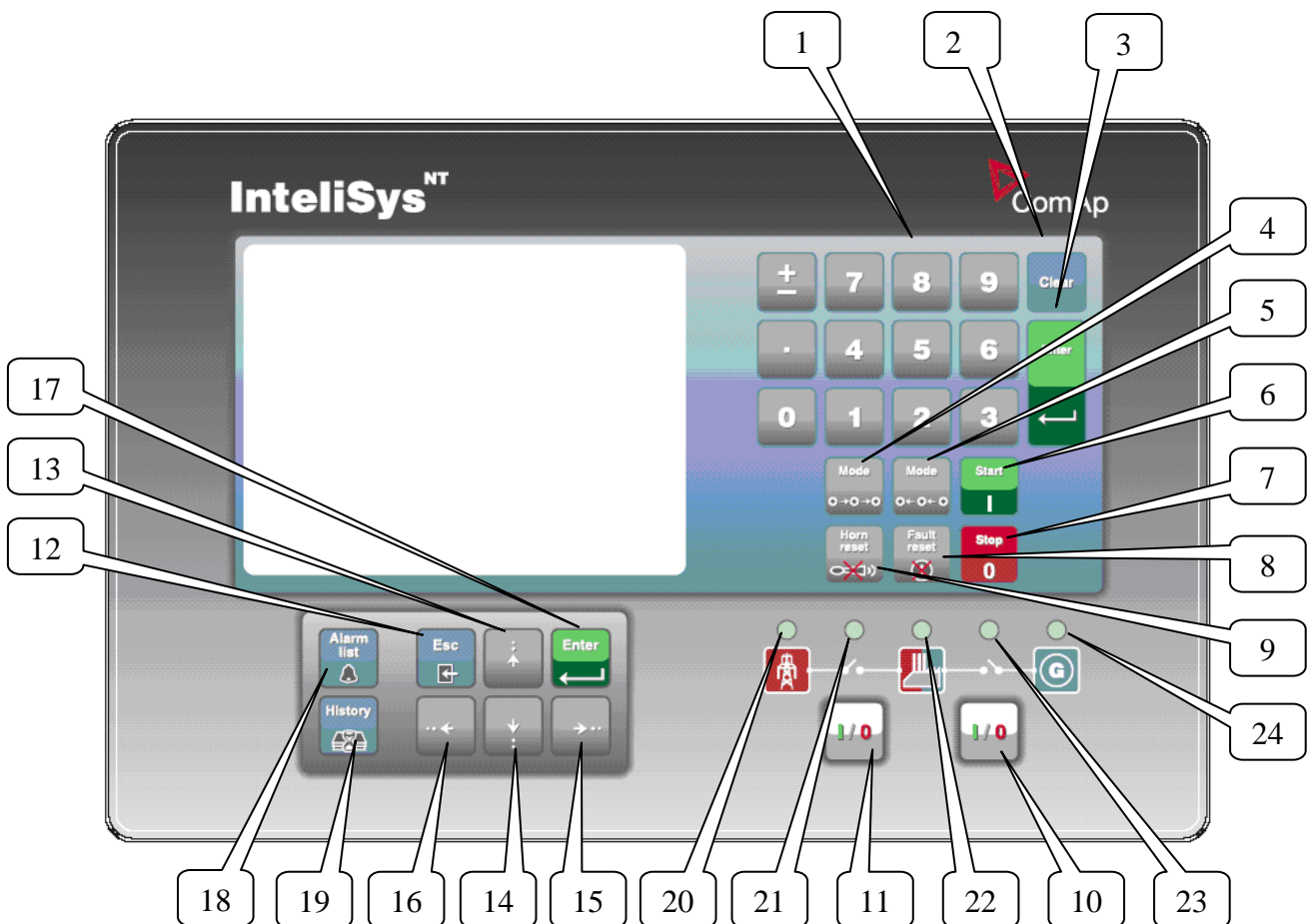
Pushbuttons:

1. Numeric keypad

Where	Function
Setpoints screen	Change setpoint value
Menu screen	Go to selected display group directly
Measurement screens	Go to another screen directly
Language screen	Select language directly
History screen	If pressed $\boxed{\pm}$ button a 🖹 symbol appears on the display (bottom right corner) and it is possible to move by one page of records using arrow buttons

2. $\boxed{\text{Clear}}$ Clears character on the left side of the cursor, exits from menu
3. $\boxed{\text{Enter}}$

Where	Function
Menu screen	Go to selected display group (Measurement CU, Measurement IO, …)
Measurement screens, Alarm list	Go to FastEdit screen (hold $\boxed{\text{ENTER}}$ for 4 sec.) – then it is possible to adjust selected setpoint (typically Base load for standard SPtM)
Setpoints screen	Go to selected setpoint group
Setpoint edit	Start setpoint edit / save changes
History screen	Go to the first column of the first history record
FastEdit screen	FastEdit exit (to previous measurement screen) with setpoint change
Language screen	Language screen exit (to menu) and save selection

4. $\boxed{\text{Mode}\rightarrow}$ Cycle forward through gen-set operation modes OFF→MAN→ SEM→ AUT→ TEST.
5. $\boxed{\leftarrow\text{Mode}}$ Cycle backward through gen-set operation modes OFF←MAN←SEM←AUT ←TEST.
6. $\boxed{\text{START}}$ Starts the gen-set in MAN or SEM mode.
7. $\boxed{\text{STOP}}$ Stops the gen-set in MAN or SEM mode.
8. $\boxed{\text{FAULT RESET}}$ Acknowledges faults and alarms.
9. $\boxed{\text{HORN RESET}}$ Deactivates the horn (audible alarm).
10. $\boxed{\text{MCB ON/OFF}}$ Opens and closes (synchronizes) the Mains circuit breaker in MAN mode (SPtM application only).
11. $\boxed{\text{GCB ON/OFF}}$ Opens and closes (synchronizes) the Generator circuit breaker in MAN mode.
12. $\boxed{\text{ESC}}$
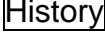
Where	Function
Measurement screens, Alarm list	Go to Menu screen
Setpoints screen	Go to Menu screen; within setpoint group, go to group list

|	
Setpoint edit	Leave setpoint edit without changes
History screen	Go to Menu screen
FastEdit screen	Fast edit exit (to previous measurement screen) without changes
Language screen	Language screen exit (to menu) without save
Table of characters	Jump among table of characters, menu and text line

13. ⇧ Select the setpoint, setpoint group, select the screen, select history record, increase setpoint value, edit stringlist value, select language
14. ⇩ Select the setpoint, setpoint group, select the screen, select history record, decrease setpoint value, edit stringlist value, select language
15. → In AlarmList screen, shift the Alarm list page down (if more than 7 items), moves history record displayed columns to the right
16. ← In AlarmList screen, shift the Alarm list page up (if more than 7 items), moves history record displayed columns to the left, go to Info screen
17. Enter   Same as 3.
18. Alarm list   Shortcut to Alarm list screen from any other screen
19. History   Shortcut to History screen from any other screen

Pushbuttons' combinations

Following table determines controller functions when ⇧, ⇩, ←, →, ENTER and PAGE buttons' combination is pressed:

Where	Pushbutton combination	Function
Measurement screens, Alarm list	ENTER + ⇧ ENTER + ⇩ ENTER + ESC	Contrast increase Contrast decrease Info screen
Info screen	ENTER + ⇧ ENTER + ⇩	Backlight increase Backlight decrease
History screen	number + ENTER	Go to record with this number

LEDs:

20. Mains status LED
21. MCB status LED
22. Load status LED
23. GCB status LED
24. Gen-set status LED

How to select gen-set mode?

Use MODE→ or ←MODE to select requested gen-set operation mode OFF – MAN – SEM – AUT – TEST. It is not possible to go directly from OFF to AUT or TEST.

Display menus

There are several display menus (functions) available: ALARMLIST, MEASUREMENT CU, MEASUREMENT IO, SETPOINTS, HISTORY, PASSWORD and LANGUAGE.
Each menu consists of several screens. Pressing the ESC (repeatedly when necessary) button the menu screen will be displayed.
Hint:
IS-NT – When pressing ESC on the screen with characters, focus jumps from menu to bottom line and table of characters. See picture on the right.
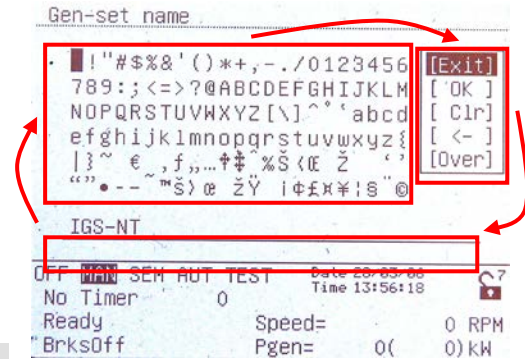
How to view Alarm list?

1. Select the ALARMLIST menu item and press ENTER or press ← in measurements' screens to go directly to the Alarm list.

How to view measured data?

1. Select the MEASUREMENT CU menu item and press ENTER.
2. Use ↑ and ↓ to select the screen with requested data.

How to view IO values?

1. Select the MEASUREMENT IO menu item and press ENTER.
2. Use ↑ and ↓ to select the screen with requested data.

How to view and edit setpoints?

1. Select SETPOINTS menu item and press ENTER.
2. Use ↑ or ↓ to select requested set points group.
3. Press ENTER to confirm.
4. Use ↑ or ↓ to select requested set point.
5. Set points marked 🔒 are password protected.
6. Press ENTER to edit.
7. Use ↑ or ↓ to modify the set point. When ↑ or ↓ is pressed for 2 sec, auto repeat function and speedup is activated. Use ← or → to change the setpoint value by 5% of it's range.
8. Press ENTER to confirm or ESC to leave without change.
9. Press ESC to leave selected set points group.

How to view the HISTORY menu?

1. Select HISTORY menu item and press ENTER
2. Use ↑ or ↓ to select a requested record.
3. Use → or ← to cycle forward/backward through columns of the record.

How to change password?

1. Select USERS/PASSWORD menu item and press ENTER.
2. Use ↑ or ↓ to select User.
3. Press ENTER to confirm.
4. Select ChangePassword and press ENTER
5. Use ↑ or ↓ or ← or → to set new password
6. Press ENTER to confirm password

How to set Language?

1. Select LANGUAGE menu item (if not already selected) and press ENTER
2. Use ↑ or ↓ to select a requested Language.
3. Press ENTER to confirm.

Hint:

If binary inputs *Lang sel int A,B,C* (for IG-NT/EE internal display and IS-Display with address 1) or *Lang sel #2 A,B,C* (for IG-Display and IS-Display with address 2) or *Lang sel #3 A,B,C* (for IS-Display with address 3) are used, it is **not** possible to change languages from Language screen.

Language	0	1	2	3	4	5	6	7
Lang sel xxx A	0	1	0	1	0	1	0	1
Lang sel xxx B	0	0	1	1	0	0	1	1
Lang sel xxx C	0	0	0	0	1	1	1	1

How to change the display contrast?

Press and hold ENTER and use ↑ or ↓ to adjust the best display contrast.

Hint:

Available from the MEASUREMENT screens only.

How to check the serial number and software revision?

Hold down the ENTER and then press ESC. On the display you can see controller INFO screen for 10 seconds.

InteliGen^NT	InteliSys^NT
Controller INFO screen contains: 1. Controller name (see **Basic settings** group) 2. Controller serial number (8 character number), SW version, ID string and release date 3. Application: SPtM, SPI, COX… Using → you can view the INFO2 screen which contains: 1. Display SW version 2. ID chip and Dongle content 3. Password decoding string	Controller INFO screen contains: 1. Controller name (see **Basic settings** group) 2. Firmware and release date 3. Controller serial number (8 character number) 4. Application: SPtM, SPI, COX… 5. Password decode number 6. IS-Display version and release date 7. Encoding: available character sets Using → you can view the INFO2 screen which contains:

	1. IDch: ID string 2. Dngl: connected dongle 3. Supported code pages Using →̄ again you can view the INFO3 screen which contains: 1. IS-Display IDchip: ID string

Available from the MEASUREMENT screens only.

How to view Connection screen on IG-Display?

Press ⬆ button when in Info screen to see information about IG-Display hardware version and properties and actual state of communication with the master controller.

How to change the display backlight intensity?

Hold down the ENTER and then press ESC. On the display you can see Controller INFO screen for 10 seconds.

Press and hold ENTER when in INFO screen and use ⬆ or ⬇ to adjust the best display backlight.

Backlight intensity is set for one of the two modes, depending on the activity of configurable binary input *Alt brightness* (IG-NT/EE and modifications). For IG-Display and IS-Display modules, this binary input is located in the Power connector and it's function is fixed (not configurable).

IS-Display with address 1 reads analog input *LCD brightness* on IS-NT-BB and changes accordingly display backlight intensity in the range 0-100%.

Hint:

Backlight intensity change available from the MEASUREMENT screens only.

How to find active alarms?

Select Alarmlist menu item and press ENTER or press ⬅ in MEASUREMENT IO or MEASUREMENT CU menu.

Inverted alarms are still active. Non-inverted alarms are not active, but not yet confirmed.

Press FAULT RESET to accept all alarms (an asterix mark disappears when an alarm is accepted by FAULT RESET). Non-active alarms immediately disappear from the list.

Active alarm list appears on the screen automatically when a new alarm comes up and Main MEASUREMENT screen was selected.

Hint:

Alarm list does not activate automatically if the display is switched to any other screen than the first one of MEASUREMENT (typically the screen that shows menu selector on the upper). The automatic jump to the alarm list screen will not occur if you are listing through the measured values, set points or history!

If setpoint **Engine protect**:*ResetActAlarms* is set to DISABLED, only inactive alarms can be reset.
If an active alarm is present in the alarm list, controller display blinks every 30 seconds.

When to use $\boxed{\text{GCB ON/OFF}}$ button?

The button is disabled in AUT mode.
In MAN and TEST modes it is enabled, but before closing of the circuit beaker, generator voltage and frequency must be within limits. The controller has internal protection to avoid the breaker closure without synchronizing.

The controller recognizes automatically:
- if there is mains / bus voltage and the gen-set shall be synchronized before closing the GCB
- or if there is no voltage on the bus and the GCB can be closed without synchronizing.

When to use $\boxed{\text{MCB ON/OFF}}$ button?

The button is disabled in AUT mode.
Use this button in MAN or TEST mode to close or open the MCB. **Be careful while doing this, because you can disconnect the load from the mains!!!**

Description of InteliGen^{NT} MEASUREMENT screens

Main measure screen
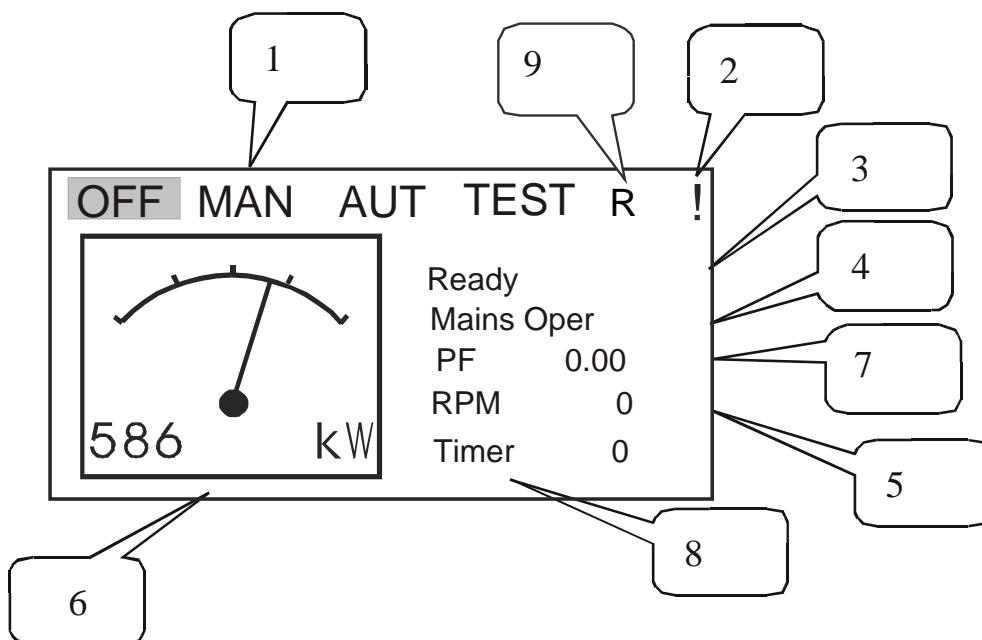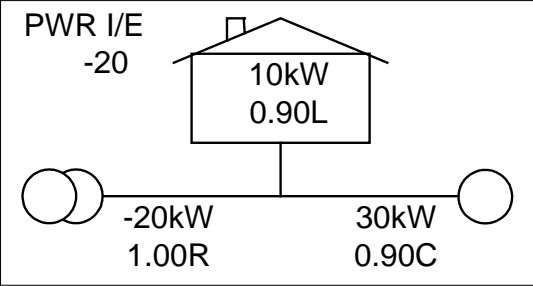
1. Operation mode of the gen-set
2. Indication of active alarm
3. Status of the gen-set

4. Actual electric condition
5. RPM of the gen-set
6. Active power
7. Power factor
8. Timer – event's counting time (e.g. prestart, cooling, …)
9. Signalizes, when any remote connection to controller is active

Following table contains an example of MINT and SPtM MEASUREMENT screens. Other applications can be slightly different.

Measurement CU

MINT	SPtM
	Total power screen PWR I/E -20 10kW 0.90L -20kW 1.00R 30kW 0.90C Left up corner: Actual power control mode None or Base or Imp/Exp and required power values. Load: Actual value of active power. Actual value of PF Mains: Actual value of active power. Actual value of PF Gen-set: Actual value of active power. Actual value of PF
Generator (frequency, voltage) Gen freq Gen V1, V2, V3 ph-N (triple bargraph) Gen V12, V23, V31 ph-ph (triple bargraph)	Generator (frequency, voltage) Gen freq Gen V1, V2, V3 ph-N (triple bargraph) Gen V12, V23, V31 ph-ph(triple bargraph)
Generator (current) Gen I1, I2, I3 (triple bargraph)	Generator (current) Gen I1, I2, I3 (triple bargraph)
Bus (frequency, voltage) Bus freq Bus V1, V2, V3 ph-N (triple bargraph) Bus V12, V23, V31 ph-ph (triple bargraph)	Mains (frequency, voltage) Mains freq Mains V1, V2, V3 ph-N (triple bargraph) Mains V12, V23, V31 ph-ph (triple bargraph)
Bus (current) Im3/EarthFC (single bargraph)	Mains (current, power, PF) Im3/EarthFC (single bargraph)

|	P mains Q mains Mains PF MaxVectorS
Gen-set power Active power (total and per phase) Power factor (total and per phase) Reactive power kVAr (total and per phase) Apparent power (total and per phase)	Gen-set power Active power (total and per phase) Power factor (total and per phase) Reactive power kVAr (total and per phase) Apparent power (total and per phase)
IG-CU Analog inputs Battery voltage (single barograph) CPU temp (single barograph) Dplus (single barograph)	IG-CU Analog inputs Battery voltage (single barograph) CPU temp (single barograph) Dplus (single barograph)
Synchroscope Slip frequency Synchroscope V1g Generator first phase voltage V1b Bus first phase voltage SRO Speed regulator output indication in the range 0 to ±10,00V VRO Voltage regulator output indication in the range 0 to 100%.	Synchroscope Slip frequency Synchroscope V1g Generator first phase voltage V1m Mains first phase voltage SRO Speed regulator output indication in the range 0 to ±10,00V VRO Voltage regulator output indication in the range 0 to 100%.
Statistic Run hours Number of starts Number of unsuccessful starts Service time 1 Service time 2 Service time 3 Service time 4	Statistic Run hours Number of starts Number of unsuccessful starts Service time 1 Service time 2 Service time 3 Service time 4
Statistic kWhours kVArhours Time Date	**Statistic** kWhours kVArhours Time **Date**
Power management Engine priority Total running actual power Actual reserve (single barograph) CAN16 CAN32	

Measurement IO

IG-CU analog inputs AI1 to AI3	IG-CU analog inputs AI1 to AI3

+ inputs/outputs of connected ECU and/or modules, depending on actual configuration.

Description of InteliSys^{NT} MEASUREMENT screens

Main menu screen
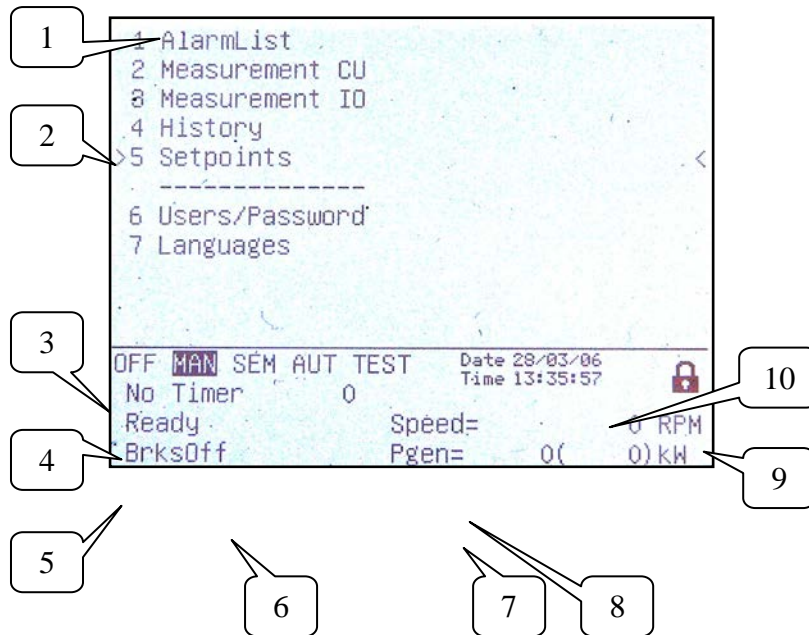
1. Selection of alarm list, measurement, history, setpoints, languages or user screen.
2. Cursor shows actual selection.
3. Controller mode indication. Black background indicates active mode (MAN mode in the above example).
4. Timer – events counting time (e.g. prestart, cooling).
5. Engine machine state indication.
6. Electric machine state indication.
7. Actual gen-set power (requested gen-set power).
8. Actual RPM.
9. Indication of access level from the controller panel:

	Closed lock	No password set
	Opened lock	Password is set. Password level is visible in opened lock.

10. Controller date and time. Can be set in **Date/Time** group of setpoints.

Alarm list

	Description
	1. Details of the alarm from ECU indicated by the cursor are displayed at the bottom line (SPN, FMI, OC numbers) 2. Asterisk indicates not accepted alarms (Fault reset has not been performed) 3. Alarms displayed inverted are active 4. Number of active / not accepted / all alarms
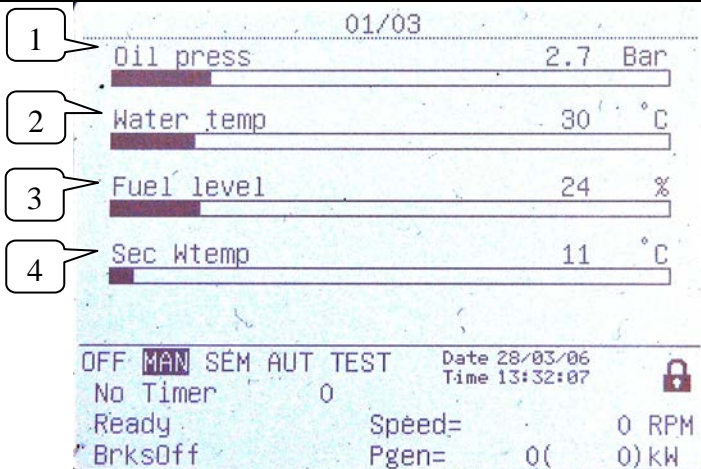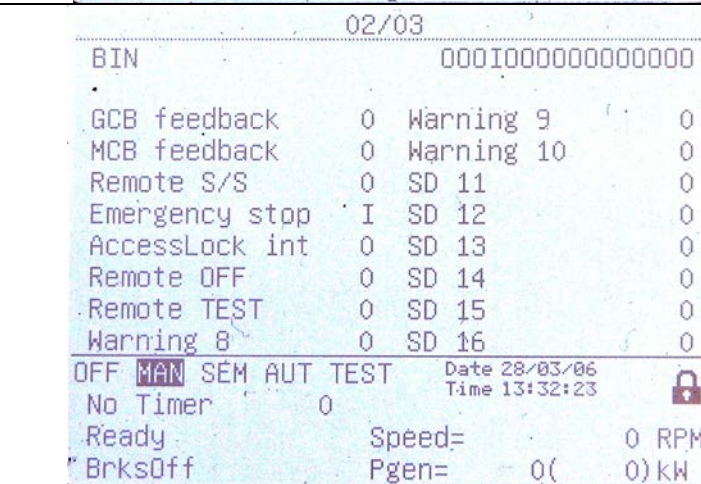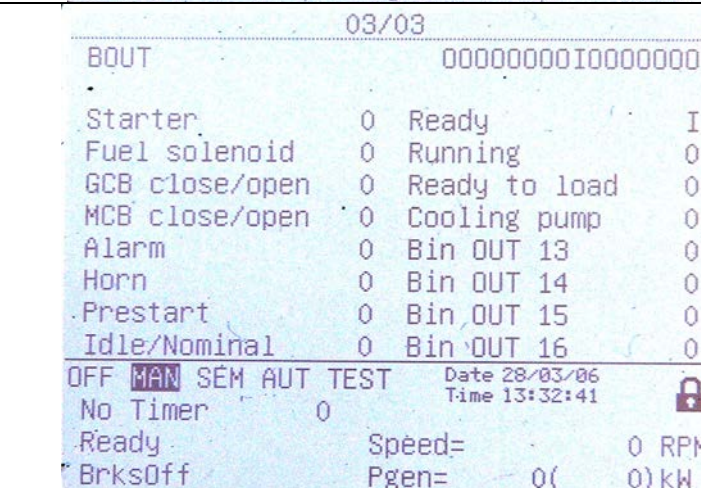
Measurement CU
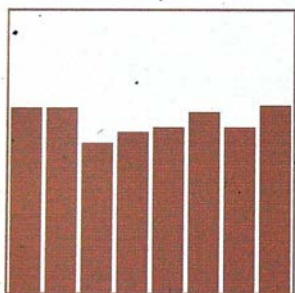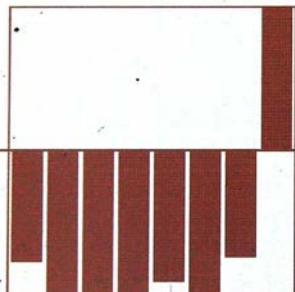
SPtM Screens	Description
	1. Remote communication indication and access lock indication (symbol is visible when Access lock BI is active). 2. Actual gen-set power. 3. Measure screen address. For jump to this screen set this number from the numeric keypad. 4. Actual engine RPM. 5. Actual power factor.
	1. Power control mode (Island / BaseLd / BldEmLm / PwrI/E / TbyPwr) 2. PF control mode (Island / BasePF / PF I/E) 3. Required power value 4. Required PF value 5. Actual Mains active power and PF values 6. Actual load active power and PF values 7. Actual gen-set active power and PF values

03/08
1 → Gen freq   0.0 Hz
2 → Gen V Ph-Ph   0   0   0 V
     Gen V Ph-N   0   0   0 V
3 → [bargraph]
     0   210   245   300
4 → Gen current   0   0   0 A
     [bargraph]
                  300
 	
OFF MAN SEM AUT TEST   Date 28/03/06
No Timer   0   Time 11:05:53 🔒
Ready   Speed=   0 RPM
BrksOff   Pgen=   0(0)kW
	1. Generator frequency
	2. Generator voltage phase-phase
	3. Generator voltage phase-neutral + triple bargraph
	4. Generator current + triple bargraph

04/08
1 → Mains freq   50.0 Hz
2 → Mains V Ph-Ph   0   0   0 V
     Mains V Ph-N   228   227   228 V
3 → [bargraph]
     0   210   245   300
4 → Im3/EarthFC   1 A
     [bargraph]
     0   650
5 → MaxVectorS   0.0 °
OFF MAN SEM AUT TEST   Date 28/03/06
No Timer   0   Time 11:06:15 🔒
Ready   Speed=   0 RPM
BrksOff   Pgen=   0(0)kW
	1. Mains frequency
	2. Mains voltage phase-phase
	3. Mains voltage phase-neutral + triple bargraph
	4. Mains current (3rd phase)/ Earth fault current
	5. Maximal vector shift

05/08
1 → Act power   0 kW
            0   0   0
2 → Pwr factor   0.00
       0.00   0.00   0.00
3 → React power   0 kVAr
            0   0   0
4 → Appar pwr   0 kVA
            0   0   0
 	
OFF MAN SEM AUT TEST   Date 28/03/06
No Timer   0   Time 11:06:40 🔒
Ready   Speed=   0 RPM
BrksOff   Pgen=   0(0)kW
	1. Active power (total and per phase)
	2. Power factor (total and per phase)
	3. Reactive power (total and per phase)
	4. Apparent power (total and per phase)

06/08	1. Battery voltage
Ubat 22.5 V	2. CPU temperature
CPU temp 39.5 °C	3. D+ voltage
Dplus 0.0 V	

OFF **MAN** SEM AUT TEST   Date 28/03/06   Time 13:23:50
No Timer   0
Ready   Speed=   0 RPM
BrksOff   Pgen=   0(0)kW

07/08

Slip freq 49.98 Hz
Angle   ######°
Gen V   0 V
Mains V   227 V

Volt match 123
       000
SpdRegOut   0.000 V
VoltRegOut   0.0 %

OFF **MAN** SEM AUT TEST   Date 28/03/06   Time 13:24:16
No Timer   0
Ready   Speed=   0 RPM
BrksOff   Pgen=   0(0)kW

1. Synchroscope
2. Slip frequency
3. Actual angle between generator and mains voltage
4. Generator first phase voltage
5. Mains first phase voltage
6. Voltage match of all three phases (0 – doesn't match; 1 – OK)
7. SRO – Speed Regulator Output indication in the range SpeedGovLowLim – SpeedGovHiLim
8. VRO – Voltage Regulator Output indication in the range 0 – 100%

08/08

Run hours   1469 h
Num starts   253
NumUnscStarts   53
Service time 1   400 h
Service time 2   800 h
Service time 3   65534 h
Service time 4   65534 h
kWhours   1256
kVArhours   1658

OFF **MAN** SEM AUT TEST   Date 28/03/06   Time 13:54:53
No Timer   0
Ready   Speed=   0 RPM
BrksOff   Pgen=   0(0)kW

Statistics
1. Total engine running hours
2. Total number of starts
3. Total number of unsuccessful starts
4. Service times (set in **Engine protect** group of setpoints)
5. Total gen-set kW hours
6. Total gen-set kVAr hours

Note:
Statistics can be set in InteliMonitor → Set statistics… after password of User 0 is entered.

Measurement IO

SPtM Screens	Description
	IS-NT analog inputs 1. Analog input 1 (e.g. Oil pressure) 2. Analog input 2 (e.g. Primary water temperature) 3. Analog input 3 (e.g. Fuel level) 4. analog input 4 (e.g. Secondary water temperature)
	IS-NT binary inputs indication
	IS-NT binary outputs indication

05/06 165.7- 165.7- 133.7- 144.5- 147.7- 162.0- 148.2- 166.4- OFF MAN SEM AUT TEST　04/04/06 　　　　　　　　　　　　　09:55:16 No Timer　　0 NotReady　　Speed=　　　　0 RPM MainsOper　　Pgen=　　0(　0)kW	If the temperatures of cylinders are configured/measured it is possible to see bargraphs of these temperatures on the separate screen.
06/06 -19.7- -51.7- -40.9- -37.7- -23.3- -37.2- -19.1- 229.8- OFF MAN SEM AUT TEST　04/04/06 　　　　　　　　　　　　　09:56:21 No Timer　　0 NotReady　　Speed=　　　　0 RPM MainsOper　　Pgen=　　0(　0)kW	Another screen shows the differences of cylinder temperatures from the average temperature.
Further screens are automatically added if I/O extension modules or ECU are connected to the controller.	

History

No.　Reason　　　　Time　　Date 0　Wrn Warning 8　　13:25:13.8　28/03/2006 -1　Sd SD 12　　　　13:25:06.4　28/03/2006 -2　Not ready　　　13:25:02.4　28/03/2006 -3　Sd SD 11　　　　13:25:00.9　28/03/2006 -4　Wrn Warning 9　　13:25:00.9　28/03/2006 -5　Terminal　　　　13:07:16.8　28/03/2006 -6　Ready　　　　　13:07:16.8　28/03/2006 -7　Switched On　　13:07:15.5　28/03/2006 -8　Ready　　　　　13:07:06.3　28/03/2006 -9　Fault reset　　13:07:06.3　28/03/2006 -10　Not ready　　　11:50:59.3　28/03/2006 -11　Start fail　　11:50:57.2　28/03/2006 -12　Gen start　　　11:49:39.2　28/03/2006 -13　Terminal　　　　10:50:47.4　28/03/2006 -14　Ready　　　　　10:50:47.3　28/03/2006 -15　Switched On　　10:50:46.1　28/03/2006 -16　Ready　　　　　10:45:33.0　28/03/2006 -17　Fault reset　　10:45:33.0　28/03/2006 -18　Not ready　　　10:45:29.1　28/03/2006 -19　Start fail　　10:45:27.0　28/03/2006 -20　Gen start　　　10:44:53.7　28/03/2006 -21　Terminal　　　　10:37:24.5　28/03/2006 -22　Ready　　　　　10:37:24.4　28/03/2006 ① No.　0　　　　Date　28/03/2006 Reason Wrn Warn　　Time　13:25:13.8	1. Bottom lines show record number, reason, date and time even if other columns are actually displayed

Users/Password

| ```
>0 - U0                              <
  1 - John
  2 - Peter
  3 - George
  4 - ---------------
  5 - ---------------
  6 - ---------------
  7 - ---------------




OFF [MAN] SEM AUT TEST    Date 28/03/06
No Timer      0           Time 13:53:09    🔒
 Ready              Speed=          0 RPM
 BrksOff            Pgen=     0(   0)kW
``` | This screen shows list of users.<br>To enter or change password of selected user press Enter. |

Users and Passwords

Up to 8 users can be defined in the system. Every user has it's own defined level of access rights. There are seven levels of password protection.
User O – Administrator has always level 7.

Hint:

The lock mark 🔒 appears before a set point name (on controller screen) if the setpoint is password protected.
The lock mark is removed only when the password is set from controller's front panel. The lock mark is still visible on controller screen even if the password is set from different terminal.
Even though one level may have been set from the front panel, the affected set points are not accessible from InteliMonitor (direct or Modem) until this level is set in InteliMonitor (direct or Modem). Set point screen opened from front panel is automatically closed 15 minutes after the last key has been pressed.

It is possible to protect remote Start, Stop, GCB and MCB commands from InteliMonitor. This seven level command protection can be configured in GenConfig.

EnterPassword

Password is a five-digit number (0 - 65535). Only setpoints associated with the entered password level can be modified.
Use ↑ or ↓ to select the desired password and then press ENTER.
Use ← or → to move the value by 5% of the range.

Mode and function description

There are four gen-set operation modes: OFF - MAN – AUT – TEST in SPtM application. There are three gen-set operation modes: OFF - MAN – AUT in SPI, COX and MINT application.
To select the mode use MODE→ or ←MODE.

OFF mode

- No start of the gen-set is possible. Outputs STARTER, GCB CLOSE/OPEN and FUEL SOLENOID are not energized.
- No reaction if buttons START, STOP, GCB ON/OFF are pressed.
- MCB behavior depends on **AMF settings**: *MCB opens on* setpoint:
  MAINSFAIL: When power-cut comes, MCB opens. After Mains returns, MCB closes with *MCB close del*.
  GEN RUNNING:When power-cut comes, MCB stays closed until the gen-set starts and produces voltage within limits.

MAN mode

1) To start the gen-set press START.
2) When the generator voltage is within limits (adjusted in the setpoints group **Generator protections**) GCB green LED on the front panel lights.
3) Press GCB ON/OFF to close the GCB. If the generator voltage is out of the limits, controller does not respond to the GCB ON/OFF .
   a) If controller detects dead bus, immediately closes GCB OPEN/CLOSE output.
   b) If controller detects voltage on the bus, starts synchronizing.
4) To stop the engine press STOP
   a) controller unloads the gen-set, opens GCB CLOSE/OPEN. Unloading is active only when binary input MCB feedback is closed or other gen-set is connected to bus. In other case GCB CLOSE/OPEN opens immediately.
   b) Gen-set is cooled down and stopped.

Hint:

Controller does not respond to external signals and/or conditions. The gen-set is fully in manual control; there is no automatic way to stop it (except protections). The gen-set stays running until STOP button is pressed.
Controller does not take place in Power management in MINT application

AUT mode

Gen-set is controlled based on external signals (Rem start/stop, Sys start/stop) or conditions (AMF, Peak shaving, Power management system, …).

Hint:

Engine does not stop, if other condition for automatic starts is active.

Example: If peak stop condition occurs, but REMOTE START/STOP is active, engine stays running.

Controller does not respond to GCB ON/OFF , MCB ON/OFF, STOP, START buttons and corresponding remote InteliMonitor or Modbus commands.

Set **Basic setting**: *FltRes GoToMAN* = ENABLED to avoid automatic engine start

!!!!! VERY IMPORTANT !!!!!!

when pressing FAULT RESET after Shut down or Slow stop alarm.
Engine can start automatically without warning when pressing FAULT RESET after shut down alarm.

TEST mode (SPtM only)

Use TEST mode for Gen-set start test if the Mains is OK or to transfer the load to the gen-set when Mains fail is announced in advance.

Hint:
The controller does not respond to GCB ON/OFF , STOP, START in *Ret from test* = AUTO.
Engine automatically starts, when TEST mode is selected.
Engine can start automatically without warning when pressing FAULT RESET after shut down alarm.

SEM mode

START – starts the gen-set.
- The controller closes GCB to dead bus.
- If the Mains is within limits and MCB is closed, the controller starts synchronizing and closes GCB when synchronizing conditions are met. Gen-set remains running in parallel.
- If Mains failure is recognized during parallel operation the controller opens MCB.
- After Mains recovers the controller synchronizes MCB and returns to parallel operation

STOP – unloads the gen-set, opens GCB, cools down the engine and stops.

AMF function – If the Mains fails while the gen-set is not running, the controller automatically starts and closes GCB.
Other automatic starts/stops (e.g. due to peak shaving, BI Rem start/stop activation) are not performed in SEM mode.

Baseload

Process control: *Load ctrl PtM* = BASELOAD
Gen-set power is kept at value given by **Process control**:*Base load* setpoint.

Internal Import export

ProcessControl: *Load ctrl PtM* = IMP/EXP
Process control: *IE measurement* = IM3 CT INPUT
Gen-set power is controlled to keep the import load at the level given by setpoint
Process control: *Import load* value.
Controller measures Import/Export value via current transformers connected to
In/Im3 terminal. The value of L3 is then multiplied by 3 to give an estimation of the
actual Imp/Exp.

List of abbreviations

AI	Analog Input
AMF	Auto Mains Failure (controller starts automatically on mains failure)
AO	Analog Output
ATS	Automatic Transfer Switch (switches the load to actually supplied bus (by mains or generators))
AVR	Automatic Voltage Regulator
BI	Binary Input
BO	Binary Output
BOC	Breaker Open & Cool-down - protection type (see application manual for details)
BTB	Bus-Tie Breaker
CAN1	CAN bus for extension modules connection (e.g. IGS-PTM, IS-BIN8/16, IS-AIN8, I-AOUT8, I-CB, IGL-RA15)
CAN2	CAN bus for intercontroller communication (in multiple applications) and monitoring (connection of I-LB, IG-IB)
Combi	Application where SPTM, SPI or MINT can be used. Application is defined by Binarary inputs combination.
COX	Application for Complex Systems where actions are taken by a PLC and the controller only follows the orders => needs an external driver (cox)
ESF	Engine Specific File
FMI	Failure Mode Identifier
GC	Graphical Characters - option for additional support of one "graphical" language
GCB	Generator Circuit Breaker
CHP	Combined Heat & Power - cogeneration application, usually with gas engine
I-AOUT8	Extension module with 8 AO
I-CB	Communication Bridge - interfaces IS, IG/IS-NT, ID controllers and non-standard engine ECU
IG-AVRi	IG Automatic Voltage Regulator interface
IG-EE	InteliGen for Electronic Engines (HW optimized for connection to an engine equipped with ECU)
IG-EEC	InteliGen EE controller with extended communication possibilities + switchable sensing ranges of AC voltages and currents
IG-IB	IG Internet Bridge - for internet/ethernet communication
IGL-RA15	Indication panel with LEDs signalizing state of 15 BO
IG-NT	InteliGen New Technology gen-set controller

IG-NT-BB	InteliGen New Technology Base Box gen-set controller (without display)
IG-NTC	InteliGen NT controller with extended communication possibilities + switchable sensing ranges of AC voltages and currents
IG-NTC-BB	InteliGen New Technology Base Box gen-set controller with extended communication possibilities + switchable sensing ranges of AC voltages and currents (without display)
IGS-NT-LSM+PMS	Dongle for IG-XX and IS-NT to enable Load Sharing control loops and PMS
IGS-PTM	Extension module with 8 BI/BO, 4 AI and 1 AO
I-LB	Local Bridge – for direct and modem monitoring and control of multiple gen-sets
IM-NT	InteliMains New Technology - Mains supervision controller; the same controller in a different SW configuration can work as a bus-tie synchronizer
IM-NT-BB	InteliMains New Technology – Mains supervision controller; (without display)
I-RB	Relay Board
IS-AIN8	Extension module with 8 AI.
IS-BIN8/16	Extension module with 8 BO and 16 BI.
IS-NT	InteliSys New technology gen-set controller
IS-NT	InteliSys New technology gen-set controller
IS-NT-BB	InteliSys New Technology Base Box (without display)
IS-NT-BB	InteliSys New Technology Basic Box (without display)
IS-NTC-BB	InteliSys New Technology Base Box gen-set controller with extended communication possibilities (without display)
KWP2000	Key Word Protocol of Scania S6 unit (for engine diagnostics)
LS	Load Sharing - analog load sharing line to interconnect the gen-sets on the site (for isolated parallel or mains parallel of multiple gen-sets); IG/IS-NT controllers use digital Load Sharing via CAN2 bus
LSM	Load Sharing Module
LT	Option for Low Temperature modification (display equipped with heating foil)
MCB	Mains Circuit Breaker
MGCB	Master Generator Circuit Breaker (sometimes used with multiple gen-sets in island parallel or mains parallel operation)

MINT	Multiple application with INTernal control loops - for multiple gen-sets in island parallel or mains parallel operation; Load Sharing and VAr Sharing controlled internally; PMS available
MP	Mains protection
NPU	Mains protection relay (voltage, frequency, vector shift protections)
OC	Occurrence Count (number of fault occurrances transmitted in diagnostic frame from ECU)
OfL	Off load - protection type (see application manual for details)
PGN	Parameter Group Number (refer to SAE J1939-71)
PMS	Power Management System - ensures optimization of running gen-sets on the site with multiple gen-sets; based on kW/kVA spinning reserve or on relative (%) load; no-master system ensures high reliability
SHAIN	Shared (virtual) Analog INput module
SHAOUT	Shared (virtual) Analog OUTput module
SHBIN	SHared (virtual) Binary INput module
SHBOUT	SHared (virtual) Binary OUTput module
SPI	Single Parallel Island application - for single gen-sets in parallel with mains or in island operation; suitable for CHP application; no MCB control
SPM	Single Prime Mover application - for single gen-sets without mains
SPN	Suspect Parameter Number (refer to SAE J1939-71)
SPtM	Single Parallel to Mains application - for single gen-sets in parallel with mains or in island operation, with AMF support; both MCB and GCB controlled
SSB	Single Stand-By application - for single gen-sets with mains and break transfer gen-set to mains
VPIO	Virtual periphery I/O module – internal "SW wires" linking binary outputs to inputs
VS	VAr Sharing - ensures VAr sharing between the gen-sets on the site via CAN bus (for isolated parallel or mains parallel of multiple gen-sets)