C6500 FlexGen UI
Manual

Contents

1 Preface

The user interface unit FlexGen UI can be connected to any FlexGen controller through the RS232 serial link.

The user interface is designed for mounting in the switch panel door. It furnishes a large back-lit display showing all electrical measurements and control parameters.

Separate LEDs provide clear indication of the generator mode and condition. In addition to showing actual alarms when they appear, the unit includes a valuable alarm log, showing previous alarms with information about the time and date when they occurred. This feature is providing a powerful tool in maintenance and service of the installation. Furthermore control keys are included enabling onsite configuration.

2 Installation

The C6500 module is secured to a 138 x 138 mm cut-out in the switchboard door using four screw clamps.

Please ensure that there is enough space around the module so that the plug-in terminals and RS232 connector can be removed and reinserted. The length of the cables should also allow for the easy removal and insertion of the plug-in terminals.
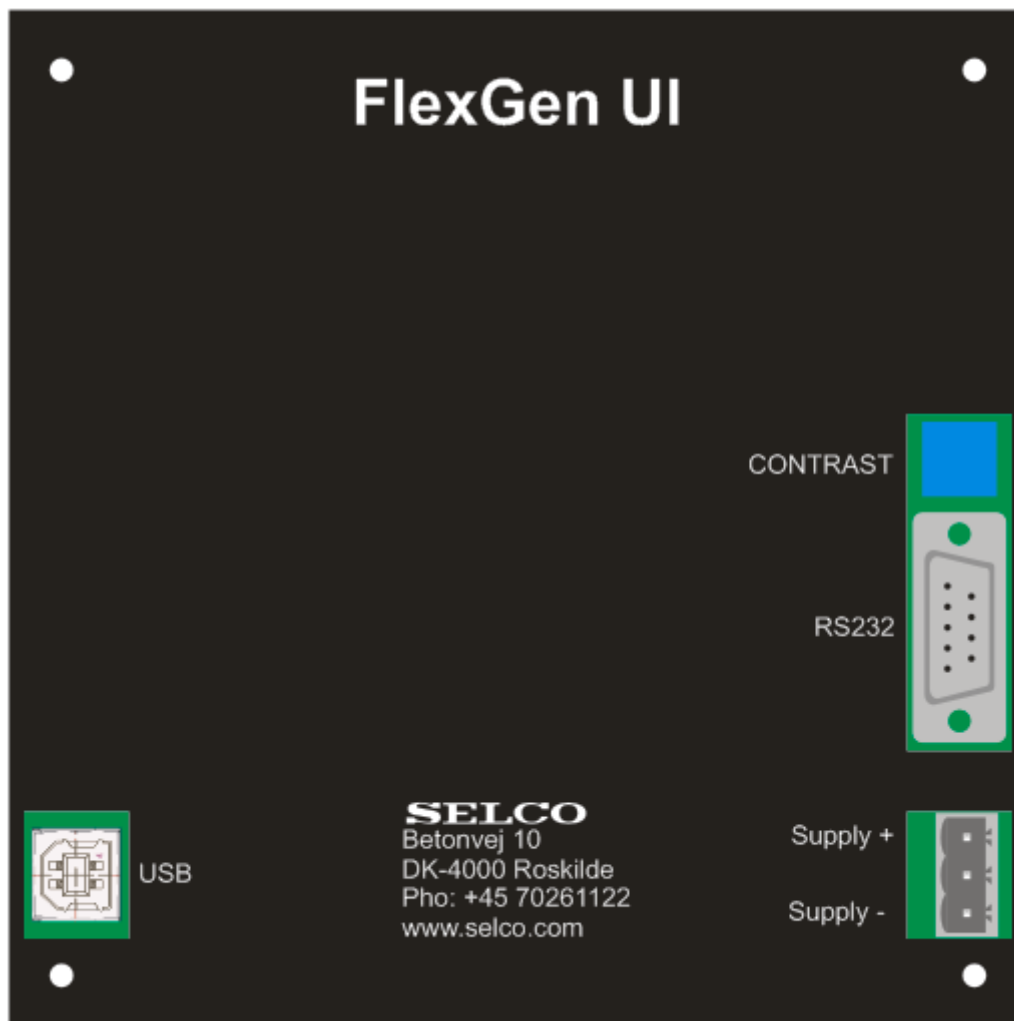
3   Connections

3.1   Power Supply

The power supply is connected to the Supply + and Supply – terminals. Rated voltage is 24V DC, the range is $24V\ DC^{+20\%}_{-30\%}$

3.2   Communication with FlexGen Generator Controller

The C6500 FlexGen UI communicates with the FlexGen Generator Controllers via the RS232 serial link. The connection between the units is done via a serial DB9 male/female cable.

The cable is delivered with the unit but can also be ordered at SELCO separately (type K3450 Serial Cable DB9 male/female).
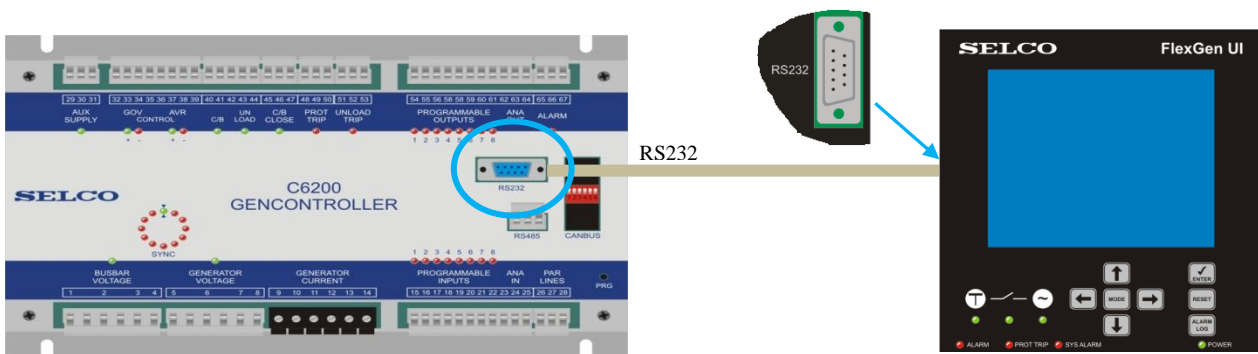
After connection the C6500 will establish communication with the Generator Controller. This takes a few seconds:

After communication has been established C6500 moves to the measurement (MEAS) display and shows measurements.

4 Front Panel

4.1 Front LEDs

Bus bar voltage LED

The BUS BAR VOLTAGE LED shows whether or not the voltage levels measured between the phases are within limits. The reference is the nominal phase-phase voltage (NOMVOLT) as configured in the C6200 Generator Controller. The voltage levels are compared to the limits defined by the voltage OK window (VOLTOKWND) of the configuration of C6200.

LED ON	Bus bar voltage ok
LED OFF	Bus bar voltage outside limits

Generator voltage LED

The Generator VOLTAGE LED shows whether or not the voltage levels measured between the phases are within limits. The reference is the nominal phase-phase voltage (NOMVOLT) as configured in the C6200 Generator Controller. The voltage levels are compared to the limits defined by the voltage OK window (VOLTOKWND) of the configuration of C6200.
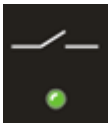
LED ON	Generator voltage ok
LED OFF	Generator voltage outside limits

Circuit breaker LED

LED ON	C/B closed
LED OFF	C/B open

Alarm LED

This LED lights in case any alarm (both acknowledged and unacknowledged) is present on the connected C6200.

LED ON	Alarm active on connected C6200
LED OFF	No alarm active on connected C6200

Prot Trip LED

This LED lights in case any protection trip is present on the connected C6200.

LED ON	Protection trip active on connected C6200
LED OFF	No protection trip on connected C6200
LED flashing	Protection trip level exceeded, delay not yet expired

Sys Alarm LED

This LED lights in case any system alarm is present on the connected C6200.

LED ON	System alarm active on connected C6200
LED OFF	No system alarm active on connected C6200

Power

This LED lights in case the power supply is present on C6500.

LED ON	Power supply present on C6500
LED OFF	Power supply of C6500 is off

4.2   Front Panel Push Buttons

Alarm Log

Press this button in order to change into the LOG display.

The LOG display shows all alarms and events of the connected C6200

```
LOG        CAN:1    Prio:2    15  18
08/06 15:13  Prio change:2
08/06 15:13  Alarm Gen start f
08/06 15:13  PM active
08/06 15:13  PM deactive
08/06 15:12  Ready
08/06 15:12  PM active
08/06 15:12  PM deactive
08/06 15:11  Alarm Gen start f
              Fault
```

Reset

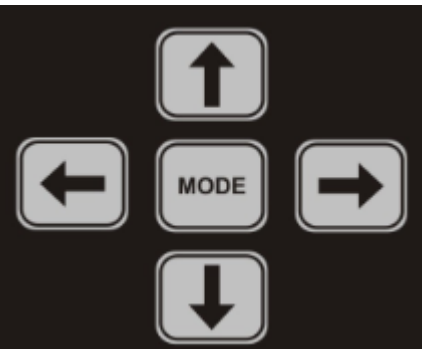Press this button for reset of alarms.

Keep button pressed for 1s for saving screen dumps to the internal memory.

Enter

Press this button in order to confirm changes during configuration from the front panel.

Navigation & Mode

Press mode in order to change into the Main Menu and back into MEAS display.
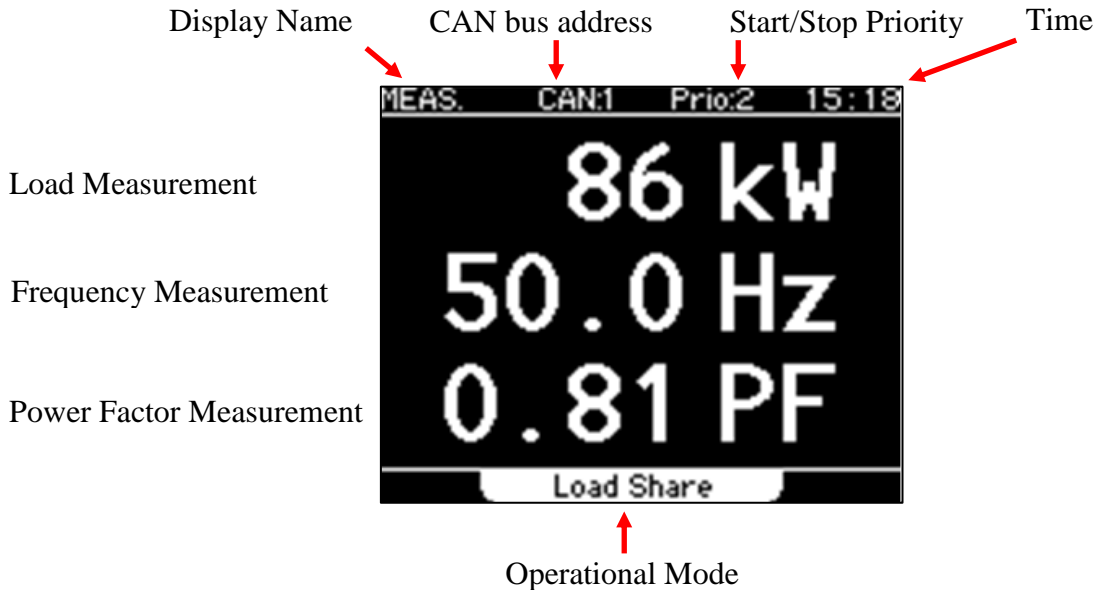
Use the cursor to choose between menus.

In the configuration menu choose and alter configuration parameters by using the cursor keys.

In the alarm log choose alarms and events by using the cursor keys.

5 User Interface

5.1 Meas Display

The measurement (MEAS) display shows the main information of the connected generator:

Display Name   CAN bus address   Start/Stop Priority   Time

Load Measurement

Frequency Measurement

Power Factor Measurement

Operational Mode

CAN bus address	CAN bus address of the connected C6200 module (here No. 1)
Start/Stop Priority	When in load depending start/stop mode this indicates the priority of the connected generator (here No. 2)
Time	Clock
Load Measurement	Load measurement of the connected C6200 (here 86 kW)
Frequency Measurement	Frequency measurement of the connected generator (here 50,0 Hz)
Power Factor Measurement	Power factor measurement of the connected generator (here 0,81)
Operational Mode	This indication describes the status of the connected C6200. Here it is in load sharing mode (generator running, C/B closed).

Following indications are possible:

Manual Mode	The connected C6200 in manual mode
Ready	Generator stopped, ready to start
Frequency Regulation	Generator running, C/B open, no voltage on bus bar
Synchronizing	Generator running, C/B open, voltage on bus bar
Load Share	Generator running, C/B closed
Fault	Alarm, system alarm or protection trip active

5.2   Main Menu

Press [ENTER] in order to move into the Main Menu:

```
Main menu
Change Priority:
Configuration:
Setting Date Time:
Generator information:
Module information:
Change password:
Service menu:
```

5.2.1   Change Priority

This menu is used for change of generator priority in load depending start/ stop mode.
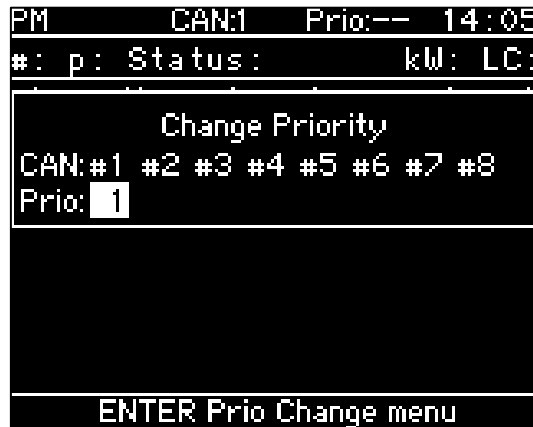
Press [→] to move into the PM Menu.

```
PM        CAN:1    Prio:--   14 05
#:  p:  Status:           kW:  LC:
 1  --  Manual mode          0    0




       ENTER Prio Change menu
```

Above display shows that the generator has no assigned priority (--) and is in manual mode.

The load is 0 kW, no Large Consumer (LC) request is active (0 kW).

Press [ENTER] to move into the Prio Change menu:

Above display indicates that the connected C6200 has CAN address 1. The Priority of the generator is 1 (first to start). Use the cursor up/ down keys to change priority. Press [ENTER] to accept the change. The display will move back to the PM menu.

5.2.2   Configuration Menu

Choose Configuration Menu in the Main Menu by pressing [↓] and press [→].

Choose pin code with the cursor keys and press [ENTER] in order to enter the configuration.

For the configuration please refer to the C6200 Configuration Manual.

5.2.3   Setting Date Time

In this menu the date and the time for the clock and event log are adjusted.

Choose Setting Date Time by the cursor up/down keys and press [→].

```
Set Date Time
Set Time: ( hh:mm )              14:46
Set Date: ( yy/mm/dd )       10/08/10
```

Choose parameter and setting with the cursor keys. Accept changes by pressing [ENTER].

5.2.4   Generator Information

This screen gives information on the connected generator.

Choose Generator information by the cursor up/down keys and press [→].

```
Generator information
Generator size:          34kW
Rated frequency:         50.0Hz
Primary voltage:         400V
CT primary current:      100.0A

Dutyhour:                374h
Next Service:            0h
Kilowatt hour:           91kW·h
```

Generator size: Rated power of the generator connected

Rated frequency: Rated frequency of the generator connected

Primary Voltage: Generator voltage

CT primary current: Primary current of the connected current transformers.

Duty hour: Running hours of the generator.

Next service: Amount of running hours until the next service is due.

Kilowatt hour: kWh the generator has supplied to the system.

5.2.5   Module Information

This screen gives information on the C6500 FlexGen UI Module and the connected C6200 Generator Controller.

Choose Module Information by the cursor up/down keys and press [→].
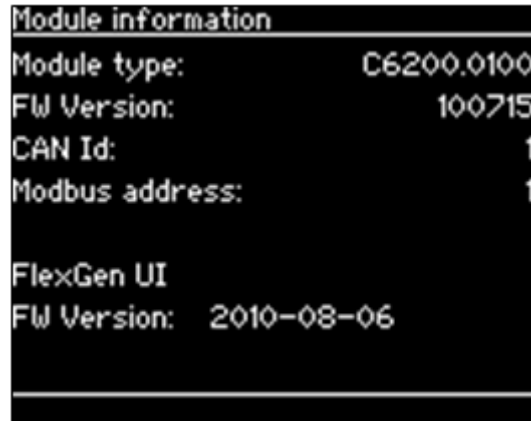
Module Type:	Type of connected generator controller (here C6200.0100)
FW Version:	Firmware version of the connected generator controller (here 100715)
CAN ID:	CAN bus address of the connected generator controller (here 1)
Modbus Address:	Modbus Address of the connected generator controller (here 1)

FlexGen UI (C6500)

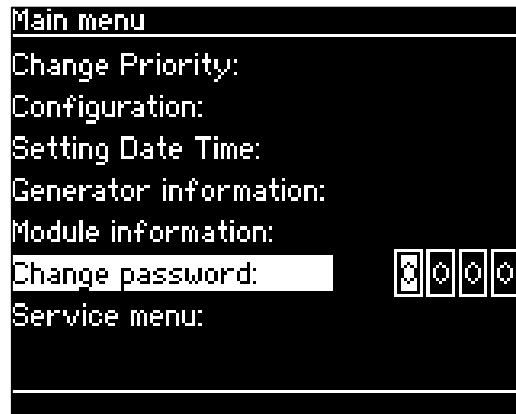| FW Version:	Firmware version of the C6500 FlexGen UI (here 100715)

5.2.6   Change Password

For changing the configuration password choose the Change Password Menu by the cursor up/down keys and press [→].

Now the module will prompt for the current password:

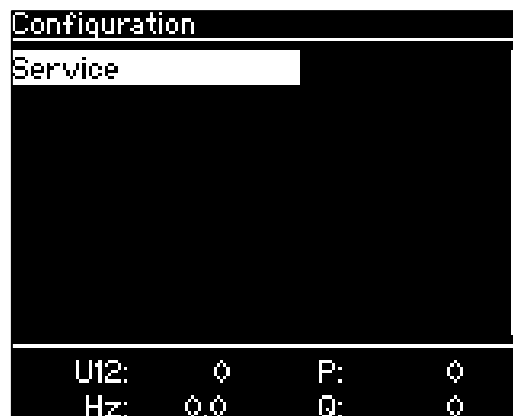Type password by using the cursor keys and press [ENTER].

```
Main menu
Change Priority:
Configuration:
Setting Date Time:
Generator information:
Module information:
Change password:         8 0 0 0
Service menu:
```

Type new password by the up/down cursor keys and press [ENTER] to accept the change.

5.2.7   Service Menu

This screen gives service information of the related generator.

Choose Service Menu by the cursor up/down keys and press [→].

```
Configuration
Service


U12:      0      P:      0
Hz:      0.0     Q:      0
```

Choose Service by pressing [→].

```
Service
Interval          31999H
Dutyhour            13H
Confirm             No
KWH               0kWh
Password            0


U12:      0      P:      0
Hz:      0.0     Q:      0
```

Interval: Running hours between each service

Dutyhour: Running hours since last service

Confirm: Confirm service and reset dutyhour

KWH   kWh since last service

Password   Service password

U12:   Voltage between L1 and L2

P: Generator active load (kW)

Hz: Generator frequency

Q: Generator reactive load (kVAr)

5.3   Alarm Log

Press [ALARM LOG] for entering the Log view.

The Log view shows the date, the time and the name of the event in chronological order.

Following alarms and events can be displayed in connection with C6200:

5.3.1   Alarms

With each alarm the alarm LED on the front will be lit. They will be indicated in the display but not trip the circuit breaker.

Name	Description
Freq Ctrl Fault	The C6200 did not succeed adjusting the frequency to rated frequency within the sync time out delay (configured in C6200).
CB Close Fault	The C6200 has tried to close the C/B, however C/B did not close.
Sync Timeout	Synchronization could not be accomplished before the synchronization time out has expired (configured in C6200).
Rampup Timeout	Active load (kW) rampup did not succeed within the ramp up time configured in C6200.
Unload Timeout	Active load (kW) unload did not succeed within the ramp time (configured in C6200).
Unload Trip Fault	C6200 has tried to trip the C/B after unload, however the C/B did not open.
Missing CB Feedback	C6200 has detected load despite the C/B being open (no C/B feedback)
CB Closed and Gen Stopped	C6200 has detected the C/B as closed despite the generator not running (C/B feedback fault).
Prot Trip Fault	C6200 has tried to trip the C/B due to a protection trip, however the C/B did not open. There is a 2s delay on this alarm, starting at the moment the trip relay activates.
Volt Ctrl Fault	The C6200 did not succeed adjusting the voltage to rated voltage within the sync time out delay (configured in C6200).
kVAr Rampup Timeout	Reactive load (kVAr) ramp up did not succeed within the ramp up time (configured in C6200).
Engine Start Fault	C6200 tried to start the generator; however the generator did not start within start time out (configured in C6200).
Engine Stop Fault	C6200 tried to stop the generator, however the generator did not stop within stop time out (same delay as the start time out configured in C6200). The delay starts when the stop output activates.
NE1 Load Trip	Non essential load (preferential) trip 1 of the connected C6200 due to over load (kW).
NE2 Load Trip	Non essential load (preferential) trip 2 of the connected C6200 due to over load (kW).

Name	Description
NE1 Freq Trip	Non essential load (preferential) trip 1 of the connected C6200 due to under frequency.
NE2 Freq Trip	Non essential load (preferential) trip 2 of the connected C6200 due to under frequency.
NE1 Cur Trip	Non essential load (preferential) trip 1 of the connected C6200 due to over current.
NE2 Cur Trip	Non essential load (preferential) trip 2 of the connected C6200 due to over current.
Cat.2 Alarm	Alarm on Cat 2 Alarm input of C6200 active.
Alarm Over Current	Over current alarm of the connected C6200.
Alarm Overload	Over load alarm of the connected C6200.
Alarm Reverse Power	Reverse power alarm of the connected C6200.
Alarm Excitation Loss	Excitation loss alarm of the connected C6200.
Alarm Over Volt	Over voltage alarm of the connected C6200.
Alarm Under Volt	Under voltage alarm of the connected C6200.
Alarm Over Freq	Over frequency alarm of the connected C6200.
Alarm Under Freq	Under frequency alarm of the connected C6200.

5.3.2   System Alarms

With each system alarm the system alarm LED on the front will be lit. System alarms do not trip the C/B.

Name	Description
No Com. To Unit	RS232 Communication with the C6200 is lost

5.3.3   Protection Trip Causes

With each protection trip the protection trip LED on the front will be lit.

Name	Description
Trip Short Circuit	Short circuit trip of the connected C6200.
Trip Over Current	Over current trip of the connected C6200.
Trip Overload	Overload trip of the connected C6200.
Trip Reverse Power	Reverse Power trip of the connected C6200.
Trip Excitation Loss	Excitation Loss trip of the connected C6200.
Trip Freq Deviation	Frequency deviation (RoCoF) trip of the connected C6200.
Trip Vector Shift	Vector shift trip of the connected C6200.
Trip Over Volt	Over voltage trip of the connected C6200.
Trip Under Volt	Under voltage trip of the connected C6200.
Trip Over Freq	Over frequency trip of the connected C6200.
Trip Under Freq	Under frequency trip of the connected C6200.
Trip External Input	External trip input of the connected C6200 activated.
Trip Engine Error Input	Engine Error trip input of the connected C6200 activated.

5.3.4   Information and Warnings

Information and warnings will not trip the breaker and no alarm LED will be lit. They will only be indicated in the display.

Name	Description
Service Warning	Service timer has expired
PM deactive	Load depending start/stop mode of C6200 is deactivated
PM active	Load depending start/stop mode of C6200 is active
Reset Alarm	Alarm on C6200 has been reset
CB Tripped	C6200 has tripped the circuit breaker
CB Closed	C6200 has closed the circuit breaker
Manual Mode	C6200 has been switched into manual mode
Auto Mode	C6200 has been switched into auto mode
Freq Ctrl	C6200 in frequency control mode (generator running, C/B open, no voltage on bus bar)
Synchronizing	C6200 in synchronizing mode
Load Share	C6200 in load sharing mode

6 I/O overview of connected C6200 Module

Pressing [ENTER] and [MODE] will move the display into the input/ output overview of the connected C6200 module. (First press [ENTER], keep the button pressed while pressing [MODE]).

This is very useful during commissioning as it is possible to check whether the inputs and outputs of the connected C6200 are activated or not.

[↑] and [↓] will move between the I/O screens.

Pressing [MODE] again will leave the I/O screen.

Following screens are available:

Digital input and output overview:

This gives an overview over the pre-defined digital inputs and outputs of C6200. Inputs and outputs marked X are active.

The numbers shown in brackets [ ] are the terminal numbers of the connected C6200.

Analogue input and output overview:

This gives an overview over the analogue inputs and outputs of C6200. This includes the analogue remote control inputs and the parallel line. The governor and AVR control outputs are shown in a separate display.

The numbers shown in brackets [ ] are the terminal numbers of the connected C6200.

Governor and AVR control output overview:

```
IO stat    CAN:2    Prio:--   12:42
[34]GOV PWM      --.- % puls
[35]GOV CUR    0.000 mA
[36]GOV VDC    4.969 V
[38]AVR PWM      --.- % puls
[39]AVR CUR    0.000 mA
[40]AVR VDC   -0.021 V



              Stop
```

This gives an overview over the governor and AVR control outputs of C6200.

The numbers shown in brackets [ ] are the terminal numbers of the connected C6200.

Programmable input and output overview:

```
IO stat    CAN:2    Prio:--   12:43
□[15]Digi In 1    □[56]Digi Out 1
□[16]Digi In 2    □[57]Digi Out 2
□[17]Digi In 3    □[58]Digi Out 3
□[18]Digi In 4    □[59]Digi Out 4
□[19]Digi In 5    □[60]Digi Out 5
□[20]Digi In 6    □[61]Digi Out 6
□[21]Digi In 7    □[62]Digi Out 7
□[22]Digi In 8    □[63]Digi Out 8

              Stop
```

This gives an overview over the programmable digital inputs and outputs of C6200. Inputs and outputs marked X are active.

The numbers shown in brackets [ ] are the terminal numbers of the connected C6200.

7 Connection of C6500 to the PC

For read out of screen shots and log files the C6500 can be connected to a PC via a USB cable.

The cable type is a standard USB A to B Cable. It can be purchased separately from SELCO. Type number is K1025.

When connected to the PC then C6500 will behave like a USB Mass Storage Device.

> *Note: USB Mass Storage*
> *The USB Mass Storage technology is widely supported. The internal drive of C6500 contains the log file and can be accessed by virtually any computer – Even if it is not running a Microsoft operation system.*
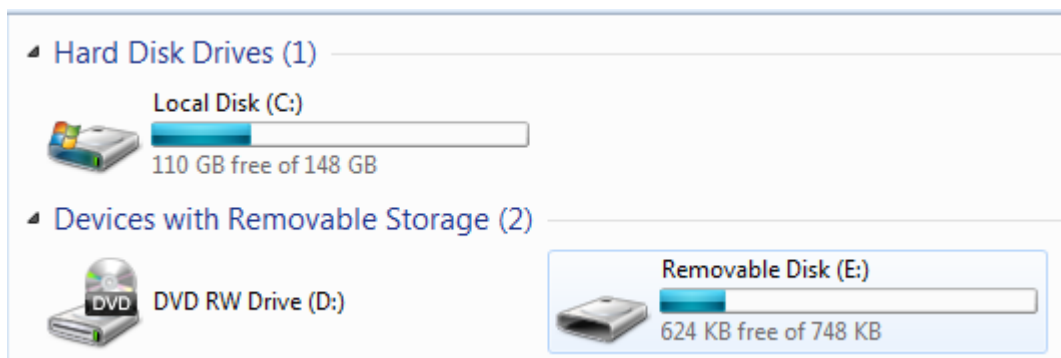
In above example the Removable Disk (E:) is the C6500.

7.1 Log File

The log txt file includes the log of the connected generator.

> *Note: Circular log*
> *When the log drive becomes full, the log-file will automatically remove the oldest log-entries in order to make room for new events. The log will always contain the most recent events.*

7.2   Screen Dumps

The scrdumps folder includes screen dumps. Screen dumps can be generated by pressing the [RESET] button and keep it pressed for 1s.

Each screen dump will be saved in the scrdumps folder as bitmap image:

Name	Date modified	Type	Size
screen01	10-08-2010 14:43	Bitmap image	3 KB
screen02	10-08-2010 14:47	Bitmap image	3 KB
screen03	10-08-2010 14:47	Bitmap image	3 KB
screen04	10-08-2010 15:14	Bitmap image	3 KB
screen05	10-08-2010 14:06	Bitmap image	3 KB

8 Specifications

Environmental conditions:

Operating temperature:	-20°C to +70°C
Humidity:	95%
Vibration:	DNV vibrations class B
Enclosure:	IP44 (panel front only)

Supply:

Primary Supply:	+24 V DC (-30 % / +20 %) Isolated, 500mA

USB:

Connection:	USB type B socket (Female connector), USB 2.0 Full speed Device, Mass storage device for inspection of log files.

Dimensions:

144 mm x 150 mm x 45 mm (cut out dimension 138 mm x 138 mm)

Weight:

Ca. 0,6 kg

Approvals/standards:

EMC standards:	EN60255-26