



INVT Studio V1.0 INVT Industrial Control System 2013-09-04

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# I. General

The manual describes the operation procedure of INVT Studio monitor system which is used to configure and monitor INVT low, medium and high voltage series inverters.

Currently, all of INVT inverters support serial Modbus protocol and some of models support Ethernet UDP protocol. Operation control and parameter modification via upper computer is intuitive and easy-to-use.

INVT Studio software supports:

★All models of INVT inverters;

★ Serial and Ethernet communication;

 $\star$ Monitoring multiple and various inverters: One computer monitors multiple and various inverters at the same time;

★Uploading and downloading parameters, importing and exporting parameter files;

★Modifying and viewing parameters;

★Bit monitoring, read and write for status word and control word of function codes;

★Inverter parameter oscillography;

★Fault diagnosis and cause prompt;

★Inverter start/stop, FWD/REV running control and fault reset;

★Parameter online help;

 $\star$ Flexible configuration of function codes: With strong generality, the software is compatible with the function codes of standard and non-standard software.

# II. Use of Studio

## 2.1 Hardware connection

1. Serial communication: The inverters are equipped with RS485 interface while PCs are generally equipped with RS232 interface. So a RS232-to-RS485 converter (HEXIN converter is recommended.) must be connected at the PC side. Then, connect via twisted pair (0-5kM). The interface connection mode is as shown in the table below:

Interface of the RS232-to-RS485 converter	Interface of the inverter	Interface of the RS232-to-RS485 converter	Interface of the inverter
T/R-	485-	T/R+	485+

The structure diagram of system connection is shown below:



2. Ethernet communication: The inverters are connected to the computer by cables. To monitor multiple inverters at the same time, the converter is necessary for networking. Three connection ways are:

(1)One-to-one topology: The RJ-45 cable is used to connect PC and the inverter directly, which is suitable for monitoring only one inverter.



### INVT inverter

(2)One-to-more topology: The RJ-45 cables are used between the converter and PC, the converter and inverters, which is suitable for monitoring multiple inverters.



INVT inverter

INVT inverter INVT inverter

(3)More-to-one topology: The RJ-45 cables are used between the switch and PCs, the switch and inverter, which is suitable for one inverter monitored by multiple PCs.



- 2.2 Software installation
- 1. Run INVT Studio Setup.exe



Pop up the setup wizard.



2. Click Next to enter the page of Select Destination Location. INVT Studio will be installed by default in the directory C:\Program Files\INVT\INVT Studio.

👼 Setup - INVI Studio
Select Destination Location Where should INVT Studio be installed?
Setup will install INVT Studio into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
C:\Program Files\INVT\INVT Studio Browse Browse
At least 39.7 MB of free disk space is required.
< <u>B</u> ack <u>N</u> ext > Cancel

3. Click Next to enter the page of Select Start Menu Folder and specify the path.

🖏 Setup - INVI Studio
Select Start Menu Folder Where should Setup place the program's shortcuts?
Setup will create the program's shortcuts in the following Start Menu folder.
To continue, click Next. If you would like to select a different folder, click Browse.
INVT\INVT Studio Browse
Don't create a Start Menu folder
< <u>B</u> ack <u>N</u> ext > Cancel

4. Click Next to enter the page of Select Additional Tasks and decide whether to create shortcuts as needed.

🖏 Setup - INVI Studio	
Select Additional Tasks Which additional tasks should be performed?	
Select the additional tasks you would like Setup to perform while installing IN then click Next. Additional icons: Create a <u>desktop icon</u> Create a <u>Q</u> uick Launch icon	VT Studio,
< <u>B</u> ack <u>N</u> ext >	Cancel

5. Click Next to enter the page of Ready to Install.

🖏 Setup - INVI Studio	
Ready to Install Setup is now ready to begin installing INVT Studio on your computer.	
Click Install to continue with the installation, or click Back if you want to revie change any settings.	2W OF
Destination location: C:\Program Files\INVT\INVT Studio	
Start Menu folder: INVT\INVT Studio	
Additional tasks: Additional icons: Create a desktop icon Create a Quick Launch icon	
< <u>B</u> ack [Install]	Cancel

6. Click Install. The setup wizard will prompt Finish after software installation is completed.



7. After installation, a quick launch icon of INVT Studio will be created on the desktop and simultaneously in start menu.



# III. Software interface



Name	Function		
Title bar	Display the name of software		
Menu bar	Provide the menu options for each operation		
Toolbar	Place the commonly used menus for ease of operation		
Status bar	Prompt inverter connection states, read and write errors of		
Status Dai	function parameters, etc.		
Main view	Oscillograph, function codes, control panel		
Project view	Display and manage the inverter		
State view	Display running parameters of the inverter		
Statiatical view	Display fault records, select parameters, inverter states,		
Statistical view	history records		

# 3.1 Menu bar

 $File(\underline{F})$   $View(\underline{V})$   $Operation(\underline{O})$   $Connection(\underline{C})$   $Help(\underline{H})$ 

3.1.1 File



#### ★New project

Step 1, input project name and project path.

New project		×
Project name:	Demo	
Project path:	C:\Documents and Settings\Administrator\] Browse	
(	Ok Cancel	

Step 2, add inverters: select inverter model and communication method. For serial communication, users need to confirm the slave address, serial port number, baud rate, check mode, data length, start and end bit, etc.

Add inverters		
Basic inverter information		
Model:	GD300	
Communication:	СОМ	
Name:	GD300-1	7
Basic communication settin	ig	
End address: 2		
Serial port: CO	M1 💌	
<ul> <li>Add a single</li> </ul>	inverter O Add mutiple inver	ters
Communication details set	ting	
Baud rate:	19200 💌	
Parity bit:	Even 💙	
Data bit:	8 🖌	
Stop bit:	1 🗸	
Ok	Cancel	

For Ethernet communication, users need to confirm IP address and port number. The software default network ports are 100 and 101. Only GD5000 is special, it's ports are 6000 and 6001.

Add inverters	×
Basic inverter information	
Model: GD300	
Communication: Enternet	
Name: GD300-1	
Basic communication setting	
Start address: 192 . 168 . 0 . 1	
End address: 192 . 168 . 0 . 1	
• Add a single inverter • Add mutiple inverters	
Communication details setting	
Data port: 100 💌	
Oscillographic port: 101 💙	
Ok Cancel	

Step 3, add a single inverter or multiple inverters. If users select the option of Add multiple inverters, the software will search the connected inverters automatically.

Acquiring inverter46.67%	×

Acquired	inverter			X
No.	Name	Model	Communica	Address
····· 🗹 1	GD300-1	GD300	Ethernet	192.168.33.1
	0	<	Cancel	

# ★Open project

Open the created project in file extension \*.ipj.



### ★Close project

Close the current opened project.

#### ★Save as

Save the project as another path or name.

★Exit Exit the software.

#### 3.1.2 View



Show or hide the windows at all levels and support multi-language switch.

# 3.1.3 Operation



 $\star$ Compare with the default value

Compare the current value with the default value of inverter parameters and then pick out different values. The left is the current value and the right is the compared result.

Compare							
Serial number	Name	Current value	Seri	al number	Name	Current value	Default
🛓 P00 Group Basic F	Fun		⊕ P	00 Group Ba			
P01 Group Start-u	ра			01 Group Sta.			
P02 Group Motor 1	1 p			02 Group Mot.			
B P03 Group Vector	co		D P	03 Group Ve			
P04 Group V/F cor	ntro		Đ P	05 Group Inp.			
P05 Group Input te	erm		D P	07 Group Hu			
P06 Group Output	ter		Đ P	08 Group En			
P07 Group Humar	n-M		D P	11 Group Pro.			
9 P08 Group Enhan	ced			12 Group Mot.			
+ P09 Group PID co	ntr		B-P	13 Group Sy			
P10 Group Simple	e P			- P13.00	the current of Sync	. 80.0	30.0
P11 Group Protect	tive			P13.02	Inject current 1	20.0	10.0
P12 Group Motor 2	2 p			P13.03	Inject current 2	10.0	8.0
P13 Group Synchr	on			P13.06	superimposed hig	500	10.0
+ P14 Group Serial	CO			P13.09	control parameter 2	200	2.00
+ P15 Group Profibu	JSF			P13.12	Weakening coeffic	. 0	1000
	Compare w	ith the default value			Cancel		

#### $\bigstar$ Find function code

Input the keyword to find the location of function codes in the list of function parameters.

Find			
Keyword:	terminal		Find next(N)
	Direction O Up	<ul> <li>Down</li> </ul>	Cancel

#### ★Software settings

Set the basic parameters of serial port and Ethernet communication, including the time of communication overtime, the number of retries, etc.

Software configuration	
Serial port configuration	Ethernet setting
Overtime: 1000ms 💌	Overtime: 1000ms 💌
Retries: 5	Retries: 5
Offline setting	]
Auto-reconnect Recor	nnect-time: 5min 💌
Save interval setting of history oper	ation parameters
Interval time: 30 s	
Default config	Ok Cancel

### ★Login password

Set the login password for starting the software. Software is no password by default, the original password is empty.

Login password	$\times$
Current Password:	
New Password:	
Confirm Password:	
OK Cancel	

# $\star$ Reset window

Restore the default layout when the window of INVT Studio is cluttered.



### 3.1.4 Connection



★Add inverters

Add new inverters.

 $\star$ Delete inverters

Delete the added inverters.

Delete	inverters				
No.	Name	Model	Communica	Address	Online situat
🗖 1	GD300-1	GD300	Serial port	COM11	Offline
2 🖌 🗸	GD300-2	GD300	Serial port	COM12	Offline
- 🖌 3	GD300-3	GD300	Serial port	COM13	Offline
	Ok	Cancel	All select	All delete	]

★Connect all inverters

Connect all inverters.

★Disconnect all inverters

Disconnect all inverters.

#### 3.1.5 Help



About: Software version and copyright statements User manual: The operation of the software Help: Query function code

# 3.2 Toolbar



The function of each toolbar button can be found in menu bar. Users can operate these buttons as shortcuts.

### 3.3 Status bar

A Model: GD300 Site address:1 Commuserial port Error types: Communication overtime! data address:4384 Prompt inverter connection states, read and write errors of function parameters, etc.

### 3.4 Main view

4 🔀 Oscillograph 🗍 GD300	-1Function co	des 🐁 Control panel				Þ
Select	No.	Name	Current value	Min	Max	Default
m P00 Group Basic Function						
m P01 Group Start-up and stop con						
前 P02 Group Motor 1 parameters g						
P03 Group Vector control group						
P04 Group V/F control group						
m P05 Group Input terminals group						
📺 P06 Group Output terminals group						
m P07 Group Human-Machine Inter						
P08 Group Enhanced function gr						
m P09 Group PID control group						
P10 Group Simple PLC and mult						
T P11 Group Protective parameter						
📺 P12 Group Motor 2 parameters g						
m P13 Group Synchronous motor c						
m P14 Group Serial communicatio						
m P15 Group ProfibusFunc Group						
P16 Group Ethernet function group						
All parameters / Chang	ed norometers	/P00 /P01 /P02 /P03 /	/P04 /P05 /P06 /P07 /P08 /P09 /P10 /	P11 / P12 / P13 /	P14 / P15 / P	<u>}</u>
All parameters / Chang	eu parameters	VL00 VL01 VL05 VL03	104 VL02 VL00 VL01 VL00 VL03 VL00 VL			10

The main view is divided into three subpages, oscillograph, function codes and control panel, in charge of corresponding functions. For specific information, please refer to following chapters.

### 3.5 Project view



List a large quantity of inverter monitoring information, including project name, inverter identity, list of function parameters, select parameters, state view, inverter state, fault records, history operation parameters, history fault records, control panel, etc.

In order to monitor multiple inverters, the project view will list the added inverters. Users can switch inverters by double-click the names.



### 3.6 State view

State view	/	д	x
No.	Name	Curre	^
P17.00	Set frequency	0.00	
P17.01	Output frequency	0.00	
P17.02	Ramp given freque	0.00	
P17.03	Output voltage	0	
P17.04	Output current	0.0	
P17.05	The rotation speed	0	
P17.06	Torque current	0.0	
P17.07	Magnetized current	0.0	
P17.08	Motor power	0.0	
P17.09	Output torque	0.0	
P17.10	The motor frequenc	0.00	
P17.11	DC bus voltage	564.1	
P17.12	Switch input termin	0	
P17.13	Switch output termi	8	
P17.14	Digital adjustment	0.00	
P17.15	Torque given	0.0	
P17.16	Linear speed	0	
P17.17	Length	0	
P17.18	Counting value	0	
P17.19	Al1 input voltage	0.00	
P17.20	Al2 input voltage	0.00	
P17.21	AI3 input voltage	0.00	
P17.22	HDI input frequency	0.00	
P17.23	PID given value	0.0	
P17.24	PID response value	0.0	
P17.25	Power factor of the	0.00	
P17.26	Current running time	0	
P17.27	Simple PLC and the	0	
P17.28	ASR controller output	0.0	
P17.29	Synchronous motor	0.0	
P17.30	synchronous motor	0.0	
			Y

Display inverter operation parameters. In normal communication, the data are refreshed at real time. The refresh cycle is 1s for serial communication and 200ms for Ethernet communication.

### 3.7 Statistical view

Statistical view		å ×
Name Value	Unit	~
Time Offline time:10:46:50		
Fault Unknown		
Current fault running frequency Unknown	Hz	
Ramp given frequency at curre Unknown	Hz	
Output voltage at the current fa Unknown	V	
Current fault output current Unknown	A	
Current fault bus voltage Unknown	V	
The Max temperature at Curre Unknown	τ	*
Here and A Select narrameters / Inverter state / History	operation parameters / History fault record /	

### ★Fault records

Record current inverter fault information, such as current fault time, fault code, fault running frequency, fault ramp reference frequency, output voltage, output current, bus voltage, input and output terminals state, etc.

#### ★Select parameters

Statistical vi	ew		
Select		No.	Name
	6	P12.12	Asynchronous motor 2 magn
<b>·</b>		P06.01	Y output selection
	6	P05.00	HDI input type selection
V	6	P04.00	Motor 1V/F curve setting
		P06.01 P05.00 P04.00	Y output selection HDI input type selection Motor 1V/F curve setting

Tick the commonly used function codes as select parameters to enhance the efficiency of modifying function codes. Users can directly operate function codes in statistical view.

#### ★Inverter state

Display current inverter connection state and fault type.

### ★History operation parameters

Record inverter history operation parameters in details. Users can view them according to specified date.

#### ★History fault records

Record inverter history fault records in details. Users can view them according to specified date.

# IV. Inverter parameters

### 4.1 View function codes

The main window of function parameters lists all function codes, including group, No., name, current value, maximum value, minimum value, default value and unit.

Select	No.
m P00 Group Basic Function	
m P01 Group Start-up and stop con	
m P02 Group Motor 1 parameters g	
P03 Group Vector control group	
P04 Group V/F control group	
m P05 Group Input terminals group	
m P06 Group Output terminals group	
T P07 Group Human-Machine Inter	
m P08 Group Enhanced function gr	
m P09 Group PID control group	
m P10 Group Simple PLC and mult	
m P11 Group Protective parameter	
m P12 Group Motor 2 parameters g	
T P13 Group Synchronous motor c	
The P14 Group Serial communicatio	
m P15 Group ProfibusFunc Group	
P16 Group Ethernet function group	

The tab also provides the shortcut index for each group.

```
IA All parameters / Changed parameters / P00 / P01 / P02 / P03 / P04 / P05 / P06 / P07 / P08
```

The function parameters cannot refresh automatically, so users need to refresh them manually. Right click in the display view of function codes and pop up the following menu.

Refresh the current group Refresh all
Select the current group Clear all
Fold all Open all
Multi-ary display
Help (F1)

Select Refresh current group or Refresh all as required;

Select current group/Clear all: Tick the commonly used function codes as select parameters;

Close all tree/Open all tree: Unfold or fold the parameters tree;

Multi-level display: Support bit monitoring, read and write for status word and control word of function codes;

Tultiple-system display 🛛 🔀
Original value 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Binary value: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Decimal value: 0 Hex value: 0X 0
Modified value         15         14         13         12         11         10         9         8         7         6         5         4         3         2         1         0           Binary value:         0         <
Decimal value:  Hex value: 0X 0
Ok Cancel

Help: View specific instructions of the current group.

# 4.2 Modify function codes

Each function code has corresponding icon which indicates:

Icon	Description
1	The parameters can be read or written in any condi
6	The parameter is not writable
<b>_</b>	This parameter is not writable but readable
<u>_</u>	The parameter is not writable or readable
$\bigtriangledown$	This parameter is not readable but writable

Double click the function code and pop up the modify box.

(1) If the function code is enumeration type, pop up the drop-down box. Finish setting by selecting corresponding item.

	P00.01	Run command channel	2:Communication running comm; 🗸 🛛 0
	P00.02	Communication running commands	0:Keypad running command channel
8	P00.03	Max.output frequency	1:Terminal running command channel
2	P00.04	Upper limit of the running frequency	2:Communication running command channel

(2) If the function code is numeric type, pop up the edit box. Finish setting by clicking the margin after filling in numbers in the box.

P00.03 Max.output frequency 50.00

Note: Recent modified function codes can be viewed in the page of modified parameters.

Select	No.	Name	Value after modification	Value before modificat	Modify the time
<i>6</i> 2	P00.03	Max.output frequency	20.00	50.00	2013-07-11 10:54:31
1	P00.08	B frequency command ref	1:A frequency command	0:Maximum output freque	2013-07-11 10:54:27
	P00.06	A frequency command se	4:High-speed pulse HDI	0:Keypad data setting	2013-07-11 10:54:25

4.3 Import and export function codes

Users can see the interface of inverter operation after entering the main window of control panel page.

Inverter operation				
Export fu] Import fu				
Modify-commu				

1. Export function codes: Save the function codes in different file types as needed. The parameter file (\*.dat) is self-defined in binary format; the report file (\*.csv) is comma-separated file which can be opened by Microsoft Office Excel.

Select the file type	X
Parameter file(*.dat)	Generate report(*.csv)

2. Import function codes: Import the saved binary file (\*.dat) to the current inverter in connection.

Open the existed file and pop up the following dialog box. The left is the alternative function codes and the right is the selected function codes. The function codes are user-defined and users can select them as needed.

Download to the inverter	×
Select     No.     Name     Value       Im P00 GroupBasic     P01 GroupStart     P02 GroupMotor     P03 GroupVecto       Im P02 GroupInput     P06 GroupOutp     P06 GroupOutp     P09 GroupPlut       Im P08 GroupPut D.c     P09 GroupPlD c     P10 GroupPlD c       Im P10 GroupSimpl     P11 GroupSimpl     P11 GroupSimpl       Im P11 GroupSerial     P13 GroupSerial     P14 GroupSterial       Im P16 GroupEther     P16 GroupEther     Im P16 GroupEther	Select     No.     Name     Value       III     P00 GroupBasic     III     P01 GroupStart       IIII     P02 GroupMotor     IIII     P03 GroupVecto       IIII     P03 GroupVecto     IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII
Note: the left is the alternative function code and Ok	Cancel

Right click the margin and pop up the following menu for the convenience of selecting or clearing function code groups.

Select the current group Clear the current group
Select all Clear all

3. Modify communication configuration: Flexibly configure the current communication method without reestablishment. Perform shifting between serial and Ethernet communication via the option.

Lodify the commun:	ication configur	ation 🛛 🔀			
Communication					
Communication:	СОМ	~			
	COM Enternet				
Basic communication settin	Ig				
Slave address: 1					
Serial port: CC	M1 🗸	•			
Communication details set	ting				
commanication actails set		_			
Baud rate:	19200	<u>~</u>			
Parity bit:	Even	<ul> <li>Image: A set of the set of the</li></ul>			
Data bit:	8	·			
Stop bit:	1	×			
Ok	Cancel	)			

# V. Inverter control

Ensure the site before inverter control:

Control site		
GD300-1		
GD300-2		
🔲 GD300-3		

1. Communication reference value: The value can be set in control panel page.

Communication reference value				
Communications Set frequency	*	0	Input	Settings
Communications Set frequency(0~Fmax(unit:0.01Hz)) P0.01=2 P0.06=8				

2. Operation control: To enable operation control, set running command channel to communication command channel. For example, set P00.01 to 2 for GD300 Modbus communication. Note: Due to the differences between different models of inverter operation control command, so button control panel design is different. For example, such as "Pre-excitation" button in some type of inverter doesn't exist.

Operation control			
Forw-jogging	Forw-running	Reve-jogging	Reve-running
Coast to stop	Decele-stop	Res-fault	Pre-excitation

# VI. Inverter oscillograph

# 6.1 Oscillograph interface

The oscillograph takes charge of collecting inverter data and shows the data in waveforms, for the convenience of monitoring and analyzing operation data. The interface consists of two sections: signal drawing view and signal management view.



Name	Function					
Signal drawing	Draw v	Draw waveforms, time axis, cursor, upper and lower limit of				
view	waveforms					
	Set the length of time axis, signal location, waveform color					
	waveform line, upper and lower limit of signals. The list for signa					
	management view is defined as follows:					
Signal	Signal Column Name M			Meaning		
management	1		Null	Signal waveform whether		
view			INUII	or not shown		
	2		Null	Signal waveform color		
	3		Signal name	Signal name		
	4		Connection	Whether the inverter is		

Name	Function					
			state	connected to the upper computer		
		5	Device state	Inverter state		
		6	Current value	The value at the right end of signal waveform, the newest collected data in oscillograph		
		7	L-value	The value of corresponding signal of left cursor at the point of time		
		8	R-value	The value of corresponding signal of right cursor at the point of time		
		9	Difference	The value of corresponding signal of left cursor minus the value of corresponding signal of right cursor		
	10 11	10	Interval of time	The interval of time between right and left cursor		
		Max	The maximum value in signal data			
		12	Min	The minimum value in signal data		
		13	Unit	-		

Signal management view Toolbar:



Column	Name	Meaning
1	Start	see 6.2
2	Pause	see 6.2
3	Stop	see 6.2
4	Previous waveform	see 6.3
5	The current waveform of forward 1/4	see 6.3
6	The current waveform back page 1/4	see 6.3
7	Next waveform	see 6.3
8	Waveform selection enable	see 6.4
9	X Timeline	see 6.5
10	The counter enable	-
11	Add the oscillographic channel	see 6.6
12	Delete the oscillographic channel	see 6.6
13	Signal channel up	-

Column	Name	Meaning
14	Signal channel down	-
15	Fault waveform	see 6.7
16	Open the history waveform	-
17	Save waveform	See6.8
18	Full screen / normal	-

#### 6.2 Start, pause and stop oscillograph

When the signals are added to signal management list and the device state is connected,

click the activated icon, the system will begin collecting data and drawing waveforms. In order to analyze a segment of waveforms without stopping collecting data,

click the 📩 icon, the oscillograph will stop refreshing waveforms and continue

collecting data. After the completion of collecting data, click the *licon*, the system will stop refreshing waveforms and collecting data.

#### 6.3 Shifting and playback of waveform segments

Wave segments are the waveforms at the time when the oscillograph starts and stops. Multiple waveform segments are saved in the same file. Shift to the previous segment by

clicking the 📩 icon and to the next segment by clicking the 📫 icon.

Playback function is applied when the waveform segment cannot be totally displayed at a certain range of time axis. Users can play back the waveform 1/4 of time axis range before

by clicking the icon and the waveform 1/4 of time axis range after by clicking the

🥌 icon.

#### 6.4 Selection

Select a region of waveforms by mouse, then zoom in to the whole drawing view and right click to return to original waveforms. Hold down the left mouse button at the start point (in waveform drawing view), drag the mouse to select a region and finally release. Before selection:



After selection:



6.5 Time axis

Users can click the *licon* in signal control toolbar to modify the time axis.



# 6.6 Add and delete signals

Add signals to signal management list. The system will collect the data of the signals after the oscillograph starts. Adding signals is available in oscillography. Click icon in signal control toolbar and pop up the dialog box of add signals. Single click the checkbox,

 $\sqrt{2}$  indicates the signal is selected; click again, the selection is canceled. Then single click OK button. Note: The added signals will no longer appear in the signal list. When connected to a single inverter software time add up to 10 signals, connecting more than one inverter can only add 20 at a time.

Oscillographic channel selection	×		
Inverter device	<u>^</u>		
Set frequency	=		
Output frequency			
Ramp given frequency			
Output voltage			
Output current			
The rotation speed of the motor			
Torque current			
Magnetized current			
Motor power			
Ok Cancel			

Delete signals from signal management list, together with attributes and data. Deleting signals is available in oscillography. Select the signals that need to be deleted, then click

icon in signal control toolbar.

#### 6.7 Fault waveform

To find the causes of faults, the inverter saves the running data of 200ms before the fault. The system provides the functions of black box which, recently, supports accessible fault

waveforms only when CHV190 inverter in network communication. Click the <sup>1</sup> icon in signal control toolbar, extract the fault waveforms automatically and display on the oscillograph.



### 6.8 Save waveforms

To save the collected signal data, click the icon in toolbar and pop up the dialog box of save file.

	~
Waveform file(*.osc)	~
Waveform file(*.osc)	N
Excel file (*. csv)	4

There are two ways to save files, in self-defined files (\*.osc) or comma-separated files (\*.csv).

#### 6.9 Signal attribute setting

Adjust the waveform color and line to analyze the signal data. In the list of signal management view, double click the option of signals that needs setting and pop up the dialog box of signal attribute.

Signal attribute	
Name: GD300-1\The test variable 3 Range Upper limit: 32767	Drawing the line signal
Lower limit: -32767	Color
Ok	Cancel

# 6.10 Left and right cursor

Obtain all signals values at the same point of time, difference between the corresponding signal values and the interval of time between left and right cursor. The cursor facilitates users analyzing the signal data. The mouse pointer is in the circle of the cursor. By holding down the mouse pointer, the cursor can be dragged to move left and right. Operate fine tuning via left and right keypad button.

# VII. HotKey

Help	F1
Login factory function group	F3
Logout factory function group	F4
Refresh function codes	F5
Full-screen switch	F11

# VIII. Trouble shooting

The software may have some problems during operation and corresponding solutions are shown below. If you cannot solve the problems, please contact with local dealers or INVT offices.

Common problems	Causes				Solutions
Connecting serial port	The	computer	has	no	Check computer configuration
failed	serial port.			Check computer configuration.	

		System
		attribute-hardware-device
	The number of serial port	manager: check the serial port
	is incorrect.	NO then set the serial port NO.
		of upper computer.
		Check the opened software and
	Serial port is occupied	close the software occupying the
		serial nort
	No network	Check hardware connection
		For example PC
	PC IP and inverter IP are	ID:102 168 4 101 inverter IP:
	not on the same network	102 168 / * * the fourth segment
		of the 2 <sup>nd</sup> address is any number
		between 0 and 255 except 101
Connecting network		Check whether the project file
failed	Inverter type does not	tree is consistent with inverter
	match.	type is consistent with inverter
		Check the state of network port
	Notwork port is occupied	100 and 101 natwork ports are
	ar disabled	100 and 101 network ports are
	or usableu	USEU. UTILY GLOUUU IS Special,
	Interface connection is	
	Internace connection is	Check hardware connection.
	ADHUIHIAI.	Chack whether the set parameter
	Parameter setting of	check whether the set parameter
	Selial puir uues nur	of serial port of upper computer
	Malun.	IS the same as that or inverter.
Adding inverter failed	Wrong slave address of	Check Modbus communication
	R5232-10-R5460	Replace computer or converter.
	converter does not	(Recommend HEXIN.)
	Indicin.	Chaok the invertor type
	recognized	supported by the system
	Running command	Check the manual and set
Unable to control inverter	channel is not set to	running command channel to
	communication	communication command
	command channel	channel
	Control station is not	
	selected.	Select control station properly.
Unable to set	Communication setting is	
communication set	controlled by the setting	Check the manual and set the
value	mode.	corresponding mode.
Unable to start	The configuration table	
oscillograph	and inverter do not	Update the configuration table.

	match.	
		Check the state of network port,
	The network port is	100 and 101 network ports are
	occupied or disabled	used. Only GD5000 is special,
No waveforms after		it's ports are 6000 and 6001.
the oscillograph starts		In Windows 7 system must close
	The operating system's	the firewall, or when the firewall
	firewall	prompts the pop-up dialog box
		don't choose "cancel".