

Data Concentrator TELEM-GW6

User Manual

Martem AS
2010

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1. Main Tasks

The tasks of the Data Concentrator Telem-GW6 (GW6) include the following:

- To control and monitor the system from the control center using data communication protocols IEC 60870-5-101 and IEC 60870-5-104
- To concentrate data collection from lower level peripheral devices and control them by using different data exchange protocols

2. Possible Applications

- Data acquisition and control of regional and national electricity utilities in SCADA systems for remote control and substation automation
- Comprehensive integration of different devices
- As a communication gateway

3. Features

- Telem-GW6 base model includes basic card with built-in communication ports
- Expansion card 1 and 2 are optional extras (see 5. Technical Data)
- Data concentrator with an associated event annunciator performing substation level master unit functions in the substation secondary equipment system
- Duplex data communications between the feeder and the equipment level versus the station control level in substations using different communication protocols and cross-referencing between the protocols
- Full scale data exchange between the levels of the substation control system including setting values, measurement values, registered fault parameter values, changes of state with associated time markings etc
- Data concentrator provided with serial interfaces to facilitate the connection between local output devices and external host systems
- All the settings can be changed using software configuration tool
- Output channel to the remote control system can be connected to a leased or a dial-up line using a copper line-, radio- or GSM modem
- Data concentrator GW6 is provided with control input for clock synchronizing purposes using GPS
- GW6 time synchronization by communication protocol (IEC 6870-5-101, IEC 6870-5-104) from control center's channels (GW6 time synchronization is possible from multiple control centers)
- Time synchronization of substation devices by communication protocol (IEC 6870-5-101, IEC 6870-5-103)
- Time synchronization by SNTP protocol (on Ethernet connection)
- Logical operations between digital and analog signals can be described
- PLC logic support, configuration tool with integrated PLC editor in compliance with IEC-61131-3 standard
- TELEM RTU devices can be remotely configured across Telem-GW6
- Configuration export to ASCII, CSV format files

- A user-friendly user interface similar to MS
- Collects and transfers the sequence of events (SOE) with 1 ms accuracy
- Data sending with time and quality stamp

4. View



Figure 4 Telem-GW6 view

5. Technical Data

Data communication protocols

- To higher level systems IEC 60870-5-101 unbalanced and balanced, IEC 60870-5-104
- To lower level devices IEC 61850, IEC 60870-5-104, IEC 60870-5-103, IEC 60870-5-101 Unbalanced, SPA-bus, IEC 62056-21 (IEC 1107), Modbus-RTU, DNP 3.0

Communication ports

Communication ports may be freely configured for upper or lower level communication

Built-in

- 1x Ethernet connection with RJ45 connector
- 1x RS-232 full modem serial connection with RJ45 connector
- 1x RS-422 serial connection with RJ45 connector
- 1x USB connection with Type B connector

Expansion card 1

- 1x Fiber-optic connection with ST or Versalink connectors
- 1x RS-232 with RTS, CTS handshake signal serial connection with RJ45 optically isolated connector
- 1x RS-485 serial connection with RJ45 optically isolated connector
- 1x GPS Fiber-optic connection with Versalink connector

Expansion card 2

- 8x RS-232 serial connections with RJ45 connectors

Data communication parameters

- 1 start bit
- Odd, even or no parity
- Communication rates from 300 to 115200 bit/sec
- Configurable RTS/CTS handshake for all RS-232 ports.

Electrical characteristics of isolated input

- Dielectric withstand IEC 60255-5
- Withstand to static discharge IEC 61000-4-2
- Withstand to surges, bursts IEC 61000-4-4, 61000-4-5

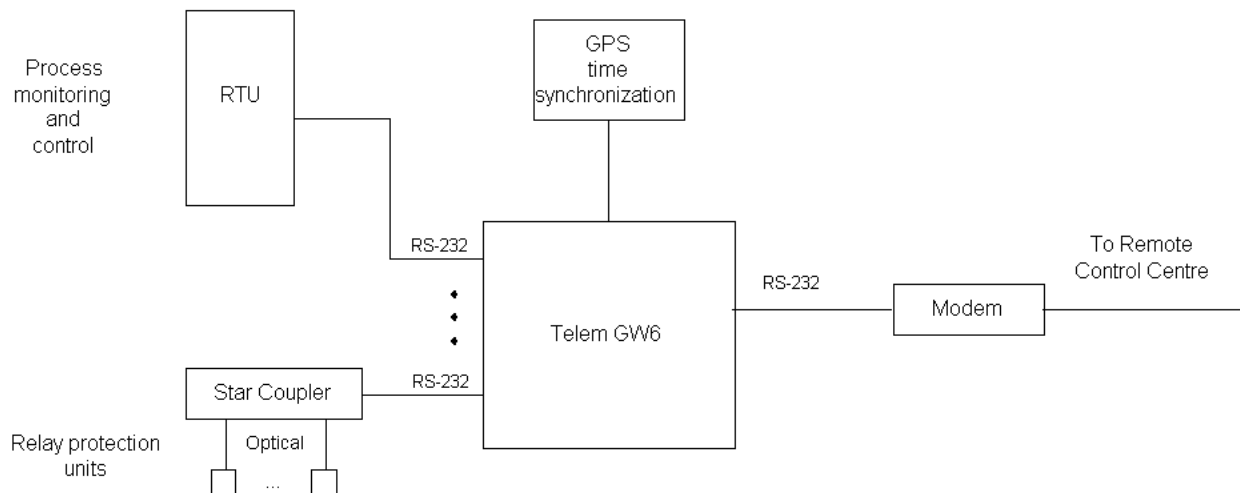
Mechanical parameters

- Degree of protection IP 32
- Dimensions (W x H x D) ~ 84 x 107 x 164
- Ambient temperature in operation -20...+50°C
- Weight ~ 1kg
- Mounting DIN rail

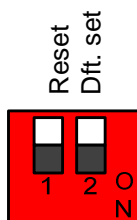
Power supply

- Supply voltage range 10 to 32 V DC
- Power consumption < 8 VA

6. Typical Application for Electric Power Station



7. Switches



1 – Reset: Switch RESET to ON state and then back to OFF state for Reset operation

2 – Dft. Set: To apply default setup:

1. Switch DFT. SET to ON state
 - *Alert indication LED starts blinking within 5 seconds
 - *Alert indication LED will blink for 2 seconds
2. Switch DFT. SET back to OFF state when the alert indication LED is **blinking** to apply default setup
 - *If DFT. SET is switched back to OFF state when the alert indication LED is not blinking, default setup will NOT be applied

8. Indication

For operation

Green LED – Blinking green indicates that the program is running

Red LED – Failure

For communication

Yellow LED – RX

Green LED – TX

Green LED at GPS port – blinking indicates the existence of GPS time synchronization.

9. Remote monitoring of operation

The status and operation of the device can be examined from log files. The log files can be accessed via built in Web interface or can be downloaded via FTP connection.

The status information is recorded in status log files and the events archive is retained in events log files.

9.1 Status log

Detected status changes and errors are stored in text files and are physically saved to device's flash memory.

The following information is recorded:

- The communication breaks and recoveries with substation equipment
- Starts
- Watchdog operations
- Software error messages
- Communication ports failures
- TCP/P channels open and close operations, failures

Last errors reside in file Errors.txt, which can grow up to 500 kB in size (about 10 000 errors). On growing over this limit the Errors.txt is renamed to Errors.NNN, where the NNN is file no. and the new Errors.txt starts to grow from zero again.

These files can be retrieved over the FTP connection:

ftp://[ip address]/errors

9.2 Events archiving

Sequence of events (SOE) are collected with 1 ms time resolution. These events are archived in the form of text files and are physically saved to device's flash memory. Events log will be updated only if any events occur. If no events are detected, nothing will be written to events text file.

Last events reside in file Events.txt, which can grow up to 500 kB in size (about 10 000 events). On growing over this limit the Events.txt is renamed to Events.NNN, where the NNN is file no. and the new Events.txt starts to grow from zero again.

Events.NNN is also copied to Events.bak , previous Events.bak is overwritten. The contents of Events.txt and Events.bak is viewable in Web Browser.

Events.NNN files are stored in compressed form in Events.bz2, which can grow up to 4 MB, after that the older files inside Events.bz2 will be deleted. All these files can be retrieved over FTP connection.

Archive includes:

- Events.txt
- Events.bak

- Compressed container Events.bz2:

Events.001 . . . Events.NNN

These files can be retrieved over the FTP connection:
[ftp://\[ip address\]/events](ftp://[ip address]/events)

10. GW6 Configuration Tool

10.1 Getting Started

Configuration program works on Windows operating systems. When starting the GW6 configuration program, user interface window with the main menu is opened:

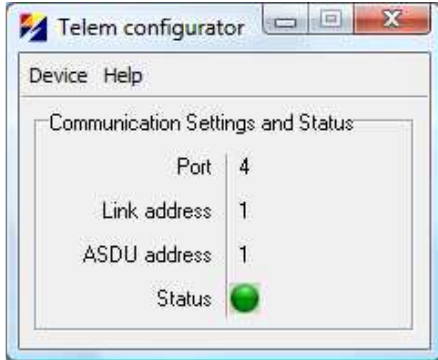


Figure 10. 1.1 User interface window

The following parameters are shown for information:

- **Port** – PC port which is used to communicate with GW6
- **Link address** – Link address of GW6
- **ASDU address** – ASDU address of GW6
- **Status** – Status of the connection. RED – no connection, GREEN – connection OK

Device menu

- **Device** – For selecting the device type
- **Communication Setup** - For changing communication parameters (figure 10.1.2)
- **GW6/RTA-A conf redirection** – see 10.5 Configuration of connected I/O modules remotely through the GW6

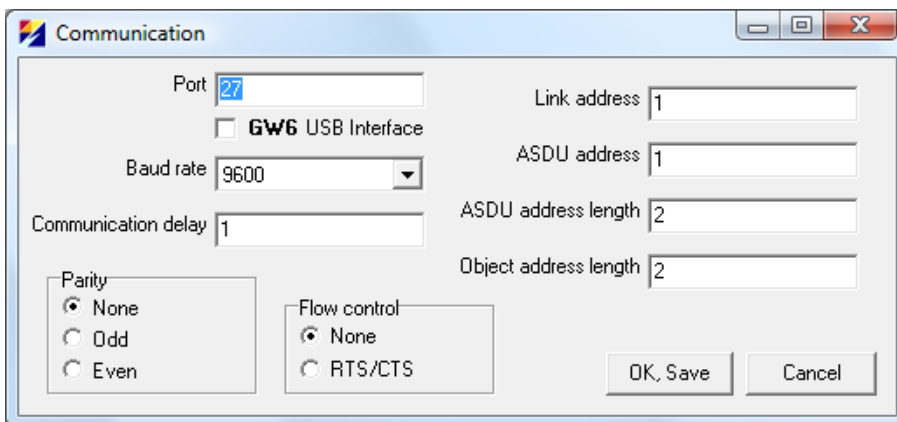


Figure 10.1.2. Communication parameters window

Fields in the communication parameters window

- **Port** – PC communication port which is used to communicate with GW6
- **GW6 USB Interface** – Check if USB port is used for communication
- **Baud rate** – Data communication rate
- **Parity** – Use of parity control bit
- **Flow control** – Determines whether the RTS/CTS handshaking is used
- **Communication delay** – Delay between reception of data and the next query in milliseconds
- **Link address** – Link address of GW6
- **ASDU address** – ASDUI address of GW6
- **ASDU address length** – The length of the ASDU address in bytes: typically 2, possible values are 1 or 2.
- **Object address length** – Length in bytes. Typically 2, possible values are 1, 2 or 3.

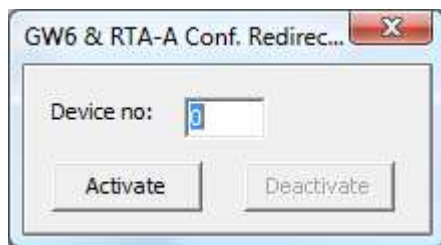






Figure 10.1.3. GW6/RTA-A conf redirection window

- **Device no** – Number of the device which is configured (see 10.3.2 Devices Tab Card)
- **Activate/Deactivate** – Activate to configure the desired device; Deactivate to configure GW6

10.2 GW6 Configuration Window

To open the GW6 configuration window, select **Device > GW6** from the user interface main menu.

Shortcut icons below the menu bar:

	Open a new configuration
	Open a configuration file
	Save the configuration to a file
R	Read the configuration from GW6
W	Write the configuration to GW6
RS	*Reset GW6
	Load XML file (IEC 61850)
R	Reload all XML files attached to devices (IEC 61850)

* Possible Reset codes:

- 1 – Simple Reset
- 2 – Reset that also clears memory buffers
- 3 – Reset that also restores the default setup

Saving, editing and opening configuration data

Configuration data is saved to the hard disk in the form of comma separated files*.CSV files when the **Save** or **Save As** command is chosen from the File menu. Correspondingly, the **Open** command from the File menu opens this type of file. **Open** and **Save** can also be accessed via shortcut icons.

*.CSV files can be conveniently edited with Excel software or even with the Note Pad program. When editing the configuration with Excel, the file has to be saved as a comma separated CSV file.

Table of configuration window menu items

Main menu	File	Common	Help
Submenu (Shortcut key)	New (Ctrl+N)	Read Configuration	Help (F1)
	Open(Ctrl+O)	Write Configuration	About
	Save (Ctrl+S)	Cancel Active Transfer	
	Save As	Send Reset	
	Exit	Analog Groups	
		Tcp/Ip Settings	
		Time Settings	
		Modem Settings	
		Port Mirroring	
		Options	

10.3 Tab Cards in the Configuration Window

Configuration and setting parameters can be utilized by using topic tab cards:

Ports, Devices, Objects, Formulas, Status.

A click on a tab card button switches between tab cards.

Using the grid area

Parameters can be selected or changed in the grid area cells. Values of some cells can be changed directly and those of others via a list box or a popup window.

Values of the same column can be copied to clipboard. Use a left mouse click together with the Shift key to copy and a left mouse click together with the Ctrl key for paste operation.

Status message in the bottom left corner of the window shows the result of the last data modification action (OK, Error, etc).

10.3.1 Ports Tab Card

Ports tab card is active when the GW6 configuration window is opened.

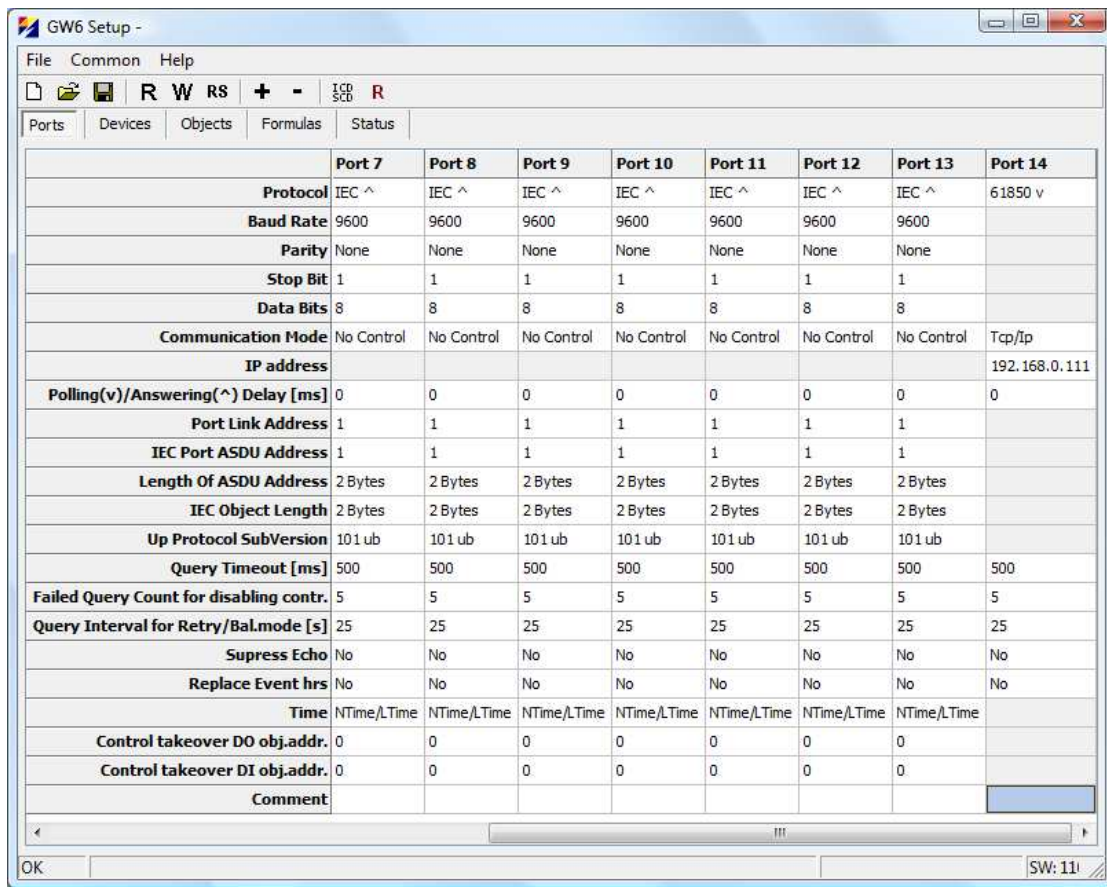


Figure 10.3 .1 Configuration window with Ports configuration tab card.

Configuration parameters of a port:

- **Protocol** – Communication protocol used by all the devices of this port. Each protocol name is accompanied with a symbol "v" or "^" which indicates whether the port is used for an uplink or a downlink channel. For example, "Modbus v" means that this port is used for downlink with Modbus protocol.
- **Baud rate** – Data communication rate
- **Parity** – Use of parity bit for all the devices on this channel
- **Stop Bit** – possible values are 1, 2
- **Data Bits** – possible values are 7, 8
- **Communication Mode** – Makes it possible to choose between the following handshaking options:
 - No control
 - Modem Callout – Port 2
 - RTS/CTS Control – Port 2
 - RS-485 – Port 5
 - Tcp/IP – Beginning from Port 14
- **IP address** – communication IP address (used if Communication Mode is set to Tcp/IP)
 - a) **61850 v**

- **Port (RFC 1006)** – IEC 61850 port of ISO Transport on top of TCP
- **IED IP Address** – an IP address of the 61850 device (server)
- **Provider IP Address** – additional IP address of GW6
- **Provider Port** – TCP port of IEC 61850 provider

b) IEC ^ or IEC v

- **Other's side IP Address** – an address of the device which can connect with GW6 using corresponding port (if set to 0.0.0.0 – all devices can connect)
- **Additional IP Address** – additional IP address of GW6
- **Port** – available network communication port (in case of IEC 60870-5-104 protocol, port 2404 is recommended)

* If 2 or more different IP addresses are needed (for connecting to multiple networks [IEC 60870-5-101, IEC 60870-5-104] or to multiple devices [IEC 61850], then it is necessary to add equal number of ports and to define a different IP address to each port. Port 14 and higher all use the same physical Ethernet port.

- **Polling(v)/Answering(^) Delay** – Delay between reception and the next query
- **Port Link Address** – Link address of the device on uplink channels
- **IEC ASDU Address** – ASDU address on uplink channels
- **Length of the ASDU Address** – Length of the ASDU address in bytes on uplink channels. Typically 2, possible values are 1 or 2
- **IEC Object Length** – Length of the IEC object address in bytes on uplink channels. Typically 2, possible values are 1, 2
- **Up Protocol Subversion** – Number of protocol subversion on uplink channels
- **Query Timeout [ms]** – Query timeout for devices on downlink channels
- **Failed Query Count for disabling contr.** – Count of timeouts after which the error flag is raised and the query of this device temporarily suspended
- **Query Interval for Retry/Bal.mode [s]** – Time period after which the suspended device is queried again
- **Suppress Echo** – If the sent messages are echoed back by the connected devices then they need to be suppressed
- **Replace Event hrs** – Yes/No. If Yes, events are sent to control centre with UCT time (the time correction value is set in Common Menu, Timing Settings)
- **Time** – Determines the time tag of events
- **Control takeover DO obj.addr.** – The address of an object that determines control takeover of that device
*the object must be determined under a virtual device in objects table
- **Control takeover DI obj.addr.** – The address of an object that shows which channel has taken over the control rights
*the object must be determined under a virtual device in objects table

10.3.2 Devices Tab Card

Device nr. -->	1	2	3	4	5
Objects	1	1	1	1	1
Link addr	1	3	4	5	
ASDU addr	1	3	4	5	
ASDU addr len	2 Bytes	2 Bytes	1 Byte	2 Bytes	
Object addr len	2 Bytes	2 Bytes	2 Bytes	2 Bytes	
In Use	Yes	Yes	Yes	Yes	Yes
Port	8	10	10	8	14
Protocol SubVersion	STD	10 IUB	103 (UB)	STD	
Protocol	ModBus v	IEC v	IEC v	ModBus v	61850 v
Periodical Time Sync	No	No	No	No	No
Time Sync Forward	Yes	Yes	Yes	Yes	Yes
Control takeover valid	No	No	No	No	No
Signals blocking obj.addr.^	0	0	0	0	0
Load XML					->
Comment					

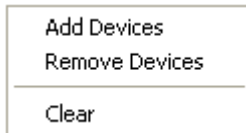
Figure 10.3.2. Devices tab card

Parameters:

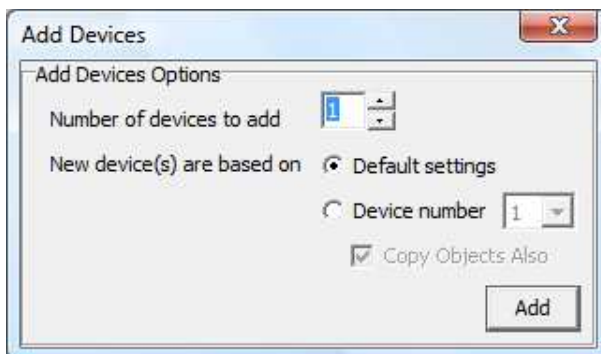
- **Device nr** – Sequence number of the device
- **Objects** – Number of objects in the device
- **Link address** – Link address of the connected device
- **ASDU address** – ASDU address of the connected device
- **ASDU address length** – Length in bytes, possible values are 1 or 2
- **Object address length** – Length in bytes, possible values are 1, 2 or 3
- **In use** – Indicates whether the device is in use or not. If the device is not in use, the whole row has a grey background
- **Port** – Port no. of GW6 to which the device is connected
- **Protocol Subversion** – Number of protocol subversion
- **Protocol** – For information only. It is filled automatically according to the number of the used port.
- **Periodical Time Sync** – Yes/No. If Yes, the device is synchronized with 10 second period
- **Time Sync Forward** – Yes/No. If Yes, the time synchronization which is received from upper channel, it is forwarded to the device
- **Control takeover valid** – Yes/No. Determines if control of the device can be taken over (see 10.3.1 Ports Tab Card)
- **Signals blocking obj.addr.^** – The address of an object which determines blocking of all signals from that device. No signals are sent to control centre from that device
*the object must be determined under a virtual device in objects table
- **Load XML** – Load XML file with object data to the device (IEC 61850)

Adding devices

By clicking on the **+** shortcut icon, a new device with default settings is added. It is also possible to add new devices with a right mouse click which makes the extended control menu to appear.



Add Devices dialog box appears.



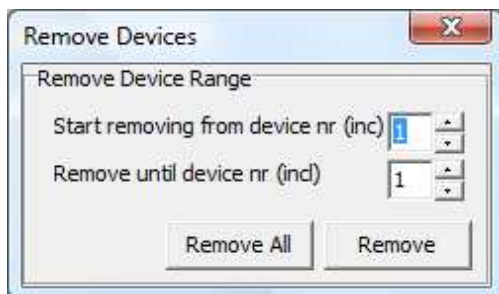
Set the Add Devices options:

- Number of devices to add
- Default settings or the device number from where the settings are derived
- Copy Object Also

Click the Add button.

Removing Devices

To remove a device, select **Remove Devices** from the extended control menu or click on the shortcut icon.



Select the range of the removed devices and click the **Remove** or **Remove All** button. The selected device is also removed after the warning dialog when **-** is clicked.

Clearing Devices

To clear the Device Tab Card, select Clear from the extended control menu. A warning window always appears before removing all devices.

Select **Yes** to accept or **No** to cancel the removal operation of the devices.

10.3.3 Objects Tab Card

Dev. nr.	Obj. nr.	Type	Analog Group	SubType ^	SubType v	Invert	Fn. Code	Info nr.	Index	Obj. Addr. v	61850 v	Obj. Addr. ^	C
1	1	DI		Single	0	No						1000	
1	2	DI		Single	0	No				1		1001	
1	3	DI		Single	0	No				2		1002	
1	4	DI		Single	0	No				3		1003	
1	5	DI		Single	0	No				4		1004	
1	6	DI		Single	0	No				5		1005	
2	1	DI		Single	Normal	No						2000	
2	2	AI	none	Normalized	0					1		2001	
2	3	AI	none	Normalized	0					1		2002	
2	4	AI	none	Normalized	0					1		2003	
2	5	AI	none	Normalized	0					1		2004	
2	6	AI	none	Normalized	0					1		2005	
3	1	DI		Single	Normal	No						3000	
4	1	DI		Single	0	No						4000	
5	1	DI		Single	Normal	No			1			5000	

Figure 10.3.3 Objects tab card

The first object of every device is used as the communication status signal of the device. If its value is “1” then communication with this device is broken. The object (first object) of communication status signal is not counted in the **Objects** row of the **Devices Tab Card**.

Columns:

Type – Object’s type: digital input (DI), digital output (DO), analog input (AI), counter (CN)

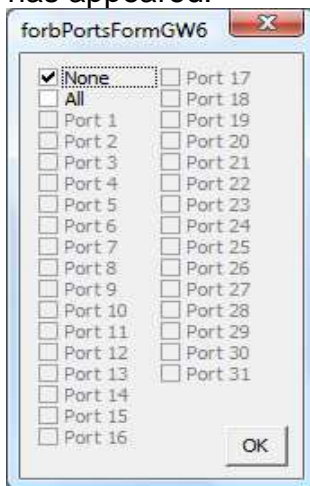
Sub Type^ – Object’s subtype for uplink.

Sub Type v – Object’s subtype for downlink.

Subtypes of object can be selected.

Object type	Subtype ^	Subtype v
DI – Digital input	Single Double	Normal Fallback
DO – Digital output		Single Double Direct Execute Select Execute
AI – Analog input	Normalized Floating point Step position	

- **Invert** – Object's value will be inverted
- **Fn.code** – Function code on the IEC 60870-5-103 protocol
- **Info no.** – Information number on the IEC 60870-5-103 protocol
- **Index** – Object index on the IEC 60870-5-103 and IEC 61850 protocol. It indicates the order number of the object in message types 3 and 9 of analog measurements.
- **Object.Addr v** – Object's downlink address
- **61850 v** – 61850 address (loaded from device's XML file)
- **Object.Addr ^** – Object's uplink address
It is possible to send the same object to control centre with different addresses by creating several object with identical downlink addresses and different uplink addresses.
- **DB1 %Fs** – Deadband (% of full scale). If the value has changed less than the deadband then it is not spontaneously transferred.
- **DB2 %Fs** – This is used instead of DB if the **Crit.Min** and **Crit.Max** fields are used and the value falls within these limits. **In case of offline** (GSM) channel, if the change in value is bigger than deadband 2 (% of full scale) then a call to SCADA system is initiated.
- **Raw Min, Raw Max** – Minimum and maximum raw values of analog measurement (before scaling).
- **Scale Min, Scale Max** – Minimum and maximum scale values of analog measurement.
- **Forb. Ports** – Uplink port to which the object's value transfer is blocked. To select uplink ports, which should not be used for transferring these object values, double-click on the cell of the **Forb. Ports** column and select the corresponding ports from the window that has appeared.




- **Crit.Min %Fs / On Ev. Nr; Crit.Max %Fs / Off Ev. Nr**
Crit.Min %Fs; Crit.Max %Fs – Minimum and maximum values in % from the full scale of analog measurements on which GW6 initializes communication (Fig. 10.5.1). If Crit. Max and Crit. Min do not have values, DB1 and DB2 are in use. If Crit. Max and Crit. Min have the value 'zero', only DeadB1 is in use. If the analog measurement value is

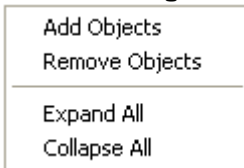
between Crit. Min and Crit. Max, DB2 is in use. If the analog measurement value is out of limits, DB1 is in use.

On Ev. Nr; Off Ev. Nr – Corresponding event number used in SPA-bus

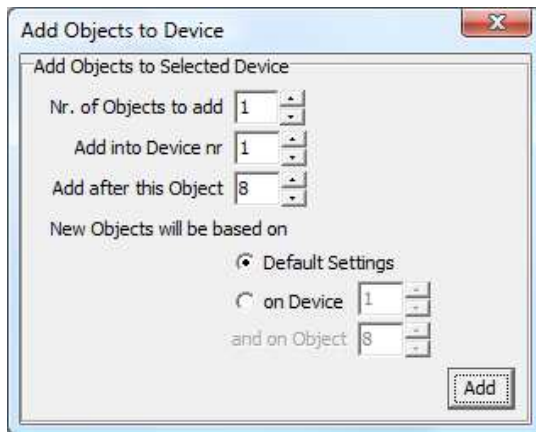
- **Forb. Calling** – Block object's value transfer.
- **Ch. Nr.** – Channel nr. for SPA-bus communication protocol
- **noFlags** – If set to Yes, removes Invalid and Not Topical flags from object status. Used for objects, which statuses are not received with General Interval time (short circuit current, etc.)

Adding Objects


By clicking on the  button, a new device with default settings is added. Objects can also be added with a right click on the device tab card. After that the following extended control menu appears:

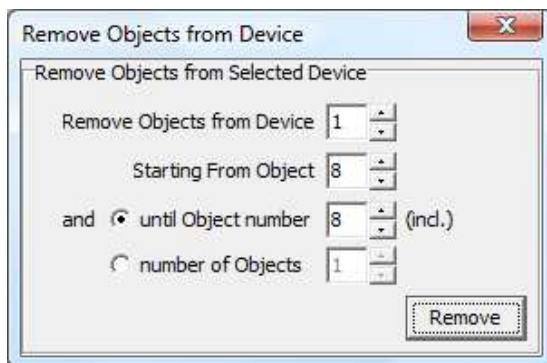


When selecting Add Objects, the following dialog box appears:



Removing Objects

To remove a device, click the  button or select Remove Devices from the extended control menu. The following dialog box appears:



Hints

- Repeated object addresses are shown on yellow background.
- When leaving the Object Tab Card, all the objects are hidden. To see the objects on returning to Object Tab Card, use **Expand All** from the extended control menu that appears after a right click.

10.3.4 Formulas Tab Card

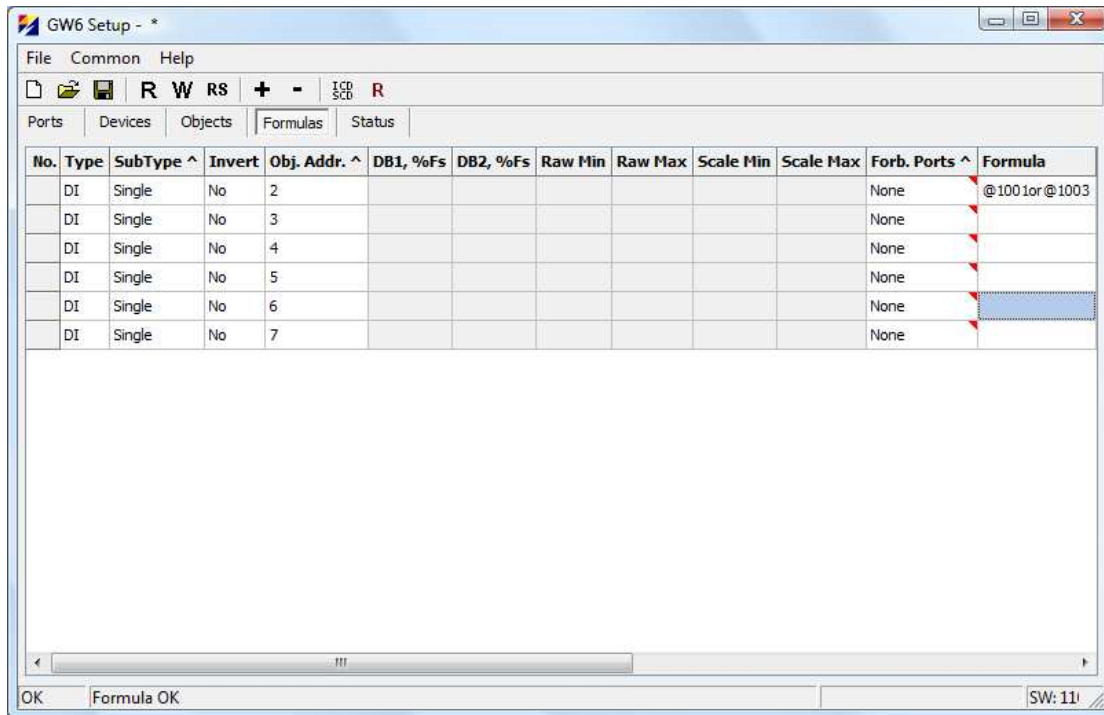


Figure 10.3.4 Formulas tab card

Columns:

- **Type, Sub Type , Invert, Object Adr ^, DB1 %Fs, DB2 %Fs, Crit. Min %Fs, Crit. Max %Fs, Raw Min, Raw Max, Scale Min, Scale Max, Forb.Ports** - as in **Objects Tab Card**
- **DO addr.** – Number of the digital output (1...16) in the TLM GW-IO device controlled by the result of this formula
- **Execution count** – The number of control operations executed, if no feedback is received from control relay. Feedback must be determined in the formula
- **Delay** – Delay in seconds
- **Forb. DO** – The number of DO, which control is forbidden with the result of this formula
- **Formula** – Formula string

Editing formulas

Formulas can be created between the values of analog and/or digital objects.

Referencing to object values

To use the measurement object in the formula, insert an @ sign together with the **object address up**.

Example: @101 points to the value of the object with an address to uplink 101.

Constants

Constants can be used in formulas.

Example: 1.1+2.2+3 consists of 3 floating point constants

Brackets

Brackets can be used in formulas to change the priority of the operation.

Example: $\sqrt{(@101/2+@102)}$; $(@201+@202+@203)/3$


Operators


Oper.	Obj. type	Description	Sample	*Priority
+	DI/AI	Addition	@101+3,2	3
-	DI/AI	Subtraction	@101-0,49	3
*	DI/AI	Multiplication	@101*2	2
/	DI/AI	Division	@101/2	2
^	DI/AI	Exponentiation	@101^2	1
<	DI	Greater than	@101<0,499	4
>	DI	Less than	@101>0,5	4
sqr	DI/AI	Square	sqr(@101*10)	0
sqrt	DI/AI	Square route	sqrt(@101*10)	0
and	DI	Logical conjunction	@201and@202	5
or	DI	Logical disjunction	@201or@202	6
xor	DI	Exclusive disjunction	@201xor@202	6
not	DI	Logical negation	not@201	0
dbl	DI	Converts 2 single digital inputs into a double signal	@202dbl@201, where @202 – ON state signal @201 – OFF state signal	7
sin	DI/AI		sin@301	0
cos	DI/AI		cos@301	0
tan	DI/AI		tan@301	0
arcsin	DI/AI		arcsin@301	0
arccos	DI/AI		arccos@301	0
arctan	DI/AI		arctan@301	0

* priority determines the order of operations in the formula (the highest priority is 0)

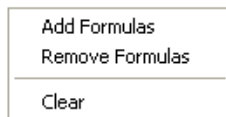
Notes

- All analog values should be scaled before making calculations; therefore, it is very important to fill the **Raw Min, Raw Max, Scale Min, Scale Max** fields with Normalized values that are used in calculations.
- After editing the formula, the program automatically validates this formula and shows the result in the status area. If the formula is incorrect, the background of the edited formula is changed to pink and an error message is displayed in the status area.

- By clicking on the  button, a new formula row with default settings is added.

By clicking on the  button, the selected formula row is removed.

- Formula rows can also be added, removed or cleared by using the extended control menu like in the Object Tab Card. It appears with a right mouse click on the Formula Tab Card.



To add a Formula, select **Add Formulas**, to remove a Formula, select **Remove Formula** and to clear all formulas, select **Clear**.

- The formulas of DI type of objects can contain AI values and floating point constants. If the result of the formula is greater than 0, the value of the DI object is "1"; if the result of the formula is less than or equal to 0, the value of the DI object is "0".
- < or > statement: if the statement is true, the value of the DI object is 1; if the statement is false, the value of the DI object is 0.

10.3.5 Status Tab Card

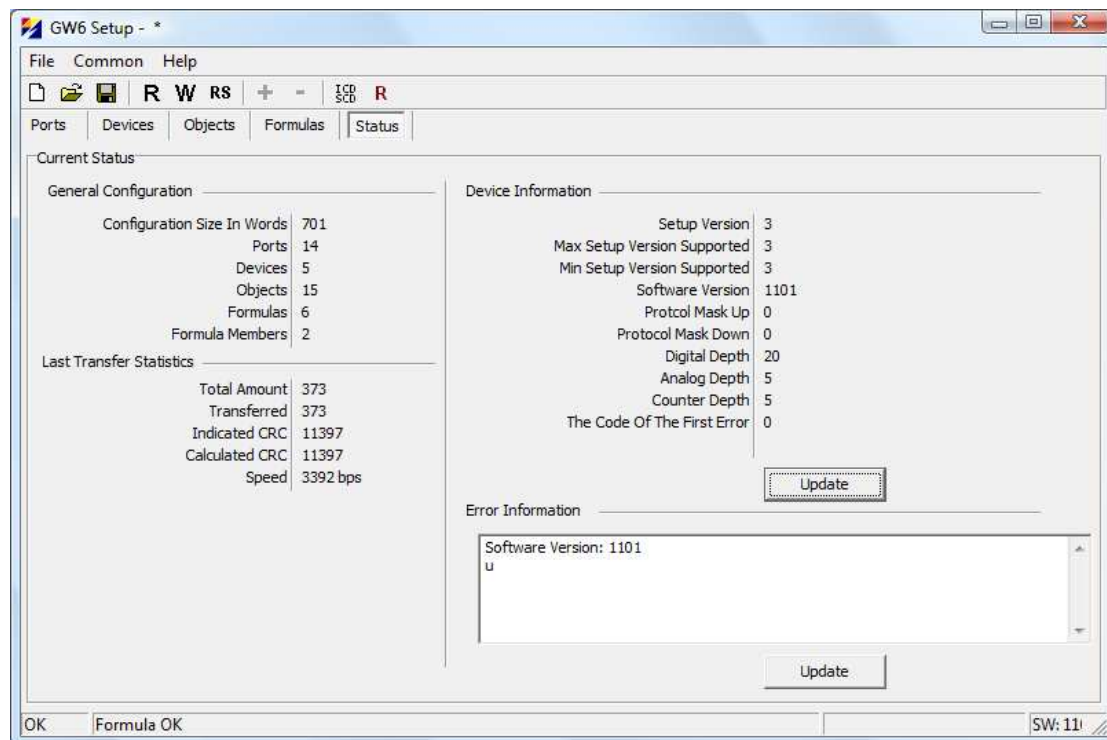


Figure 10.3.5 Status tab card

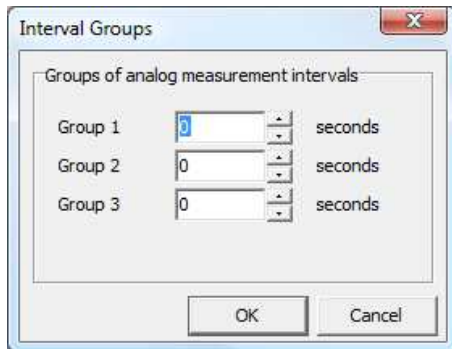
Status tab card presents the status of GW6 general configuration parameters and transfer statistics.

Update button is used to get information from the connected GW6 and it is displayed under Device Information.

10.4 Common menu item

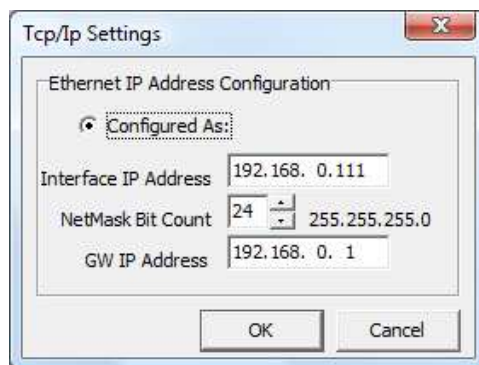
10.4.1 Analog Groups

Interval groups are used to specify the time interval of sending analog input value to the remote control center when the value has changed less than the deadband. Interval groups can be added to analog input objects in the Configuration tool in the Objects tab (Analog group).



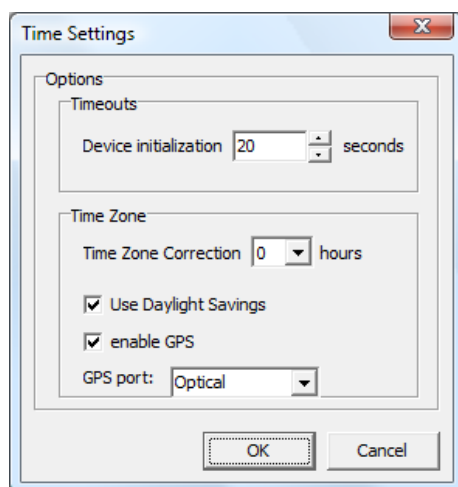
10.4.2 TCP/IP Settings

Used for GW6 to determine IP parameters.



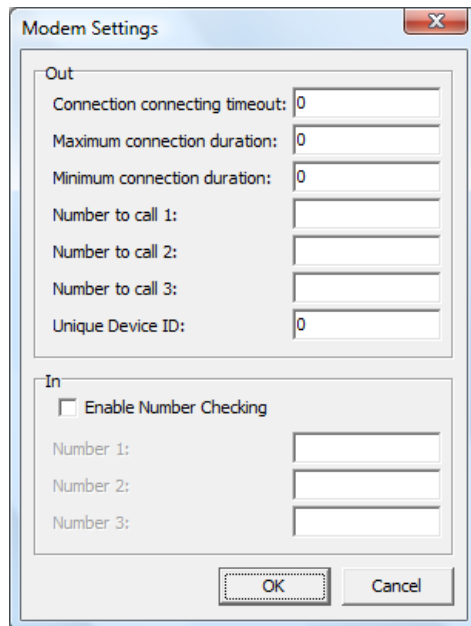
10.4.3 Timing Settings

To determine device initialization timeouts, time zone correction and GPS.



10.4.4 Modem Settings

Configure modem settings for modem callout communication mode (Port 2).



The screenshot shows a dialog box titled "Modem Settings" with a close button (X) in the top right corner. It is divided into two sections: "Out" and "In".

Out Section:

- Connection connecting timeout: 0
- Maximum connection duration: 0
- Minimum connection duration: 0
- Number to call 1: []
- Number to call 2: []
- Number to call 3: []
- Unique Device ID: 0

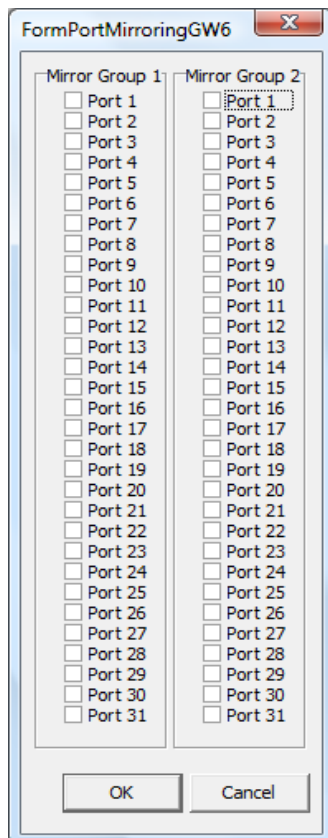
In Section:

- Enable Number Checking
- Number 1: []
- Number 2: []
- Number 3: []

At the bottom of the dialog are "OK" and "Cancel" buttons.

10.4.5 Port Mirroring

To determine 2 mirror groups (2 ports in each group). In case of mirrored ports, the data will be sent and received through both ports, but not simultaneously. If connection with first port fails, then connection will be established immediately using the second port of corresponding mirror group.



The screenshot shows a dialog box titled "FormPortMirroringGW6" with a close button (X) in the top right corner. It contains two columns of checkboxes, labeled "Mirror Group 1" and "Mirror Group 2".

Mirror Group 1:

- Port 1
- Port 2
- Port 3
- Port 4
- Port 5
- Port 6
- Port 7
- Port 8
- Port 9
- Port 10
- Port 11
- Port 12
- Port 13
- Port 14
- Port 15
- Port 16
- Port 17
- Port 18
- Port 19
- Port 20
- Port 21
- Port 22
- Port 23
- Port 24
- Port 25
- Port 26
- Port 27
- Port 28
- Port 29
- Port 30
- Port 31

Mirror Group 2:

- Port 1
- Port 2
- Port 3
- Port 4
- Port 5
- Port 6
- Port 7
- Port 8
- Port 9
- Port 10
- Port 11
- Port 12
- Port 13
- Port 14
- Port 15
- Port 16
- Port 17
- Port 18
- Port 19
- Port 20
- Port 21
- Port 22
- Port 23
- Port 24
- Port 25
- Port 26
- Port 27
- Port 28
- Port 29
- Port 30
- Port 31

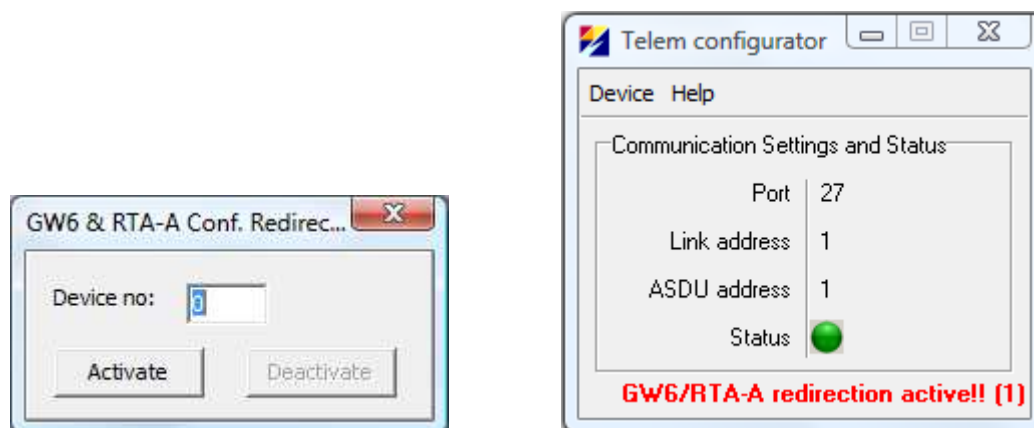
At the bottom of the dialog are "OK" and "Cancel" buttons.

Notes for configuration:

- If one GW6 is connected to another as sub-RTU (one collects data from another), then the configuration of sub-RTU can be remotely read and written through the main RTU using the configuration program.

10.5 Configuration of connected I/O modules remotely through the GW6

For configuration of connected I/O modules through the GW6 the configuration redirection is used. There is the menu item “GW6/RTA-A conf redirection” in main menu for opening the corresponding sub window.



For activating the redirection of configuration data insert the device no. from Devices tab of GW6/RTA-A configuration window and press the Activate button. After that the redirection notice is shown in the main window until to deactivation of it.

11. Configuration via FTP

1. Make a configuration with GWS.exe and save it as binary file
File > Save As > Binary file (*.bin) (gwSetup.bin)
2. Connect to GW6 via a SFTP client (for instance WinSCP)
3. Copy the binary configuration file (gwSetup.bin) to /root directory.
4. Wait about 1 minute (this is unnecessary if reset is sent through the configuration program)
5. Perform reset operation to Telem-GW6 device
6. Wait until the device resumes to it's normal operation state
7. Configuration is complete

13. Communication Cables

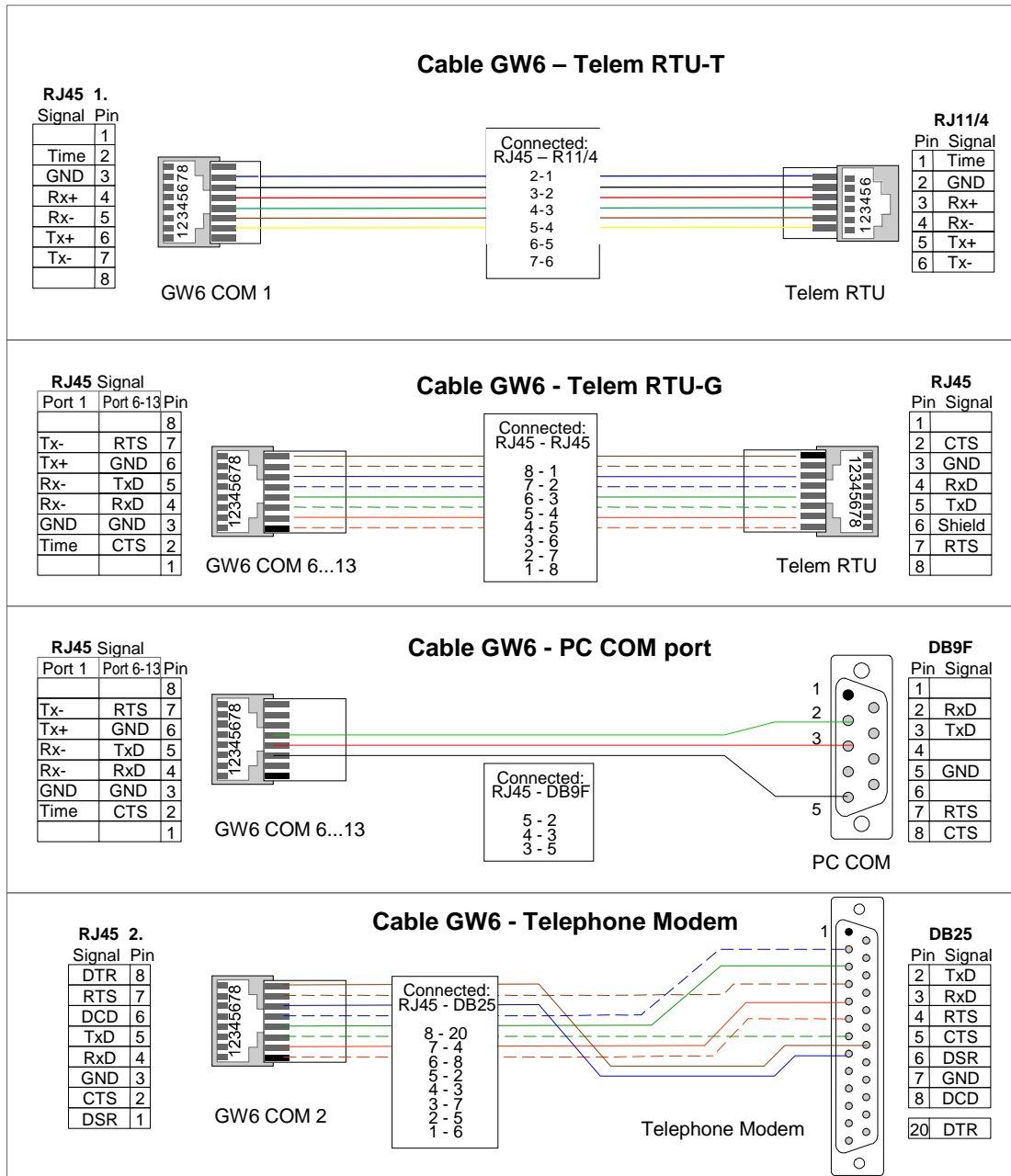


Figure 11.1 GW6 communication cables

Port RJ-45 pin layout.

PIN	Ethernet port	Port 1 RS-422	Port 2 Isolated RS-232	Port 3 Isolated RS-232	Port 5 Isolated RS-485	Port 6-13 RS-232
1	TX+		DSR		RX -	
2	TX-	Time sync. puls	CTS		RX +	
3	RX+	SGND	GND	SGND	TX -	GND
4		RX+	RXD	RXD*	TX +	RXD
5		RX-	TXD	TXD	SGND	TXD
6	RX-	TX+	DCD	SGND		GND
7		TX-	RTS			
8			DTR			

* GPS if supported

14. Firmware Update

14.1 Loading firmware through Secure Digital (SD) Memory Card slot

Updating firmware:

1. Connect Secure Digital (SD) Memory Card to your computer
2. Extract the compressed firmware update file (provided by Martem AS) to your SD Memory Card
3. Disconnect the card from your computer
4. Insert the card to Telem-GW6 SD Memory Card slot
 - * SD Memory Card slot is located at the back of the device
5. Perform reset operation to Telem-GW6 device
6. Wait until the device resumes to it's normal operation state
7. Firmware update is complete. Remove the SD Memory Card and check if firmfare update was successful

Checking results of the firmware update operation:

1. Connect the SD Memory Card to your computer
2. Open the folder you extracted earlier
3. Check if the file "res.txt" is present and open it
4. Check the state of installed files at the last part of the file
 - *If the state of update files is OK - firmware update was successful

14.2 Loading firmware via FTP

Updating firmware:

1. Connect to GW6 via a SFTP client (for instance WinSCP)
Login as ftpuser (password is provided by Martem AS)
2. Extract the compressed firmware update file (provided by Martem AS) to your computer and copy it to *ftpuser* directory
3. Wait about 1 minute (this is unnecessary if reset is sent through the configuration program)
4. Perform reset operation to Telem-GW6 device
5. Wait until the device resumes to it's normal operation state
6. Firmware update is complete.

Checking results of the firmware update operation:

1. Open the *ftpuser* directory
2. Check if the file "res.txt" is present and open it, if update fails "err.txt" file is created with some description of error.
3. Check the state of installed files at the last part of the file
 - *If the state of update files is OK - firmware update was successful

15. Notes

- If not stated otherwise on the individual pages of this document, AS Martem reserves the right to make modifications.
- Although the contents of this publication have been checked for conformity with the hardware and software described, we cannot guarantee complete conformity since errors cannot be excluded.
- The information provided in this manual is checked at regular intervals and any corrections that might become necessary are included in the next releases.
- Any suggestions for improvement are welcome.
- The contents of this manual are subject to change without prior notice.