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1 General Architecture of NMCNet GPRS Solution:

NMC Controllers can connect to your NMCNet local application easily using the iRCU box.

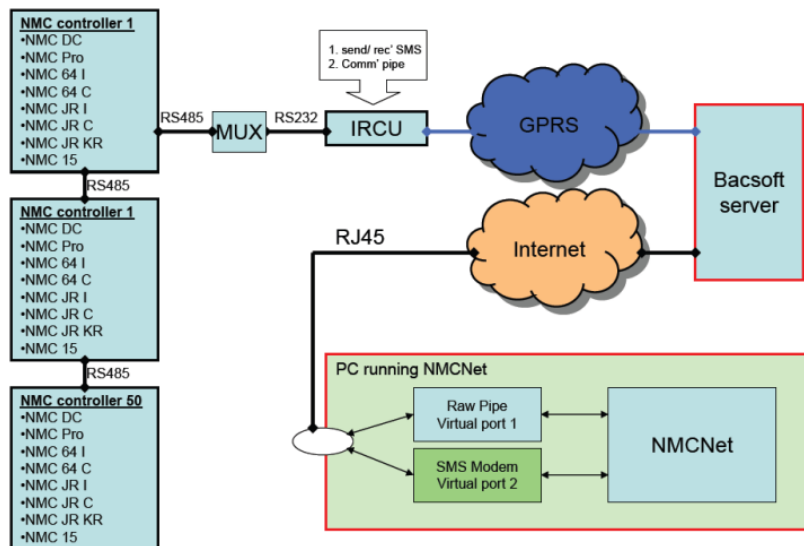
The iRCU Box will connect to your local NMCNet application using standard GPRS technology.

The connection can stay open 24/7, no dial-up or modem is needed.

The solution is constructed of the following components:

1. iRCU Box in the field connected to the NMC Controller
2. iRCU Application installed on the local PC

The architecture is as follows:



All communication is done using a dedicated server, which tunnels the connection between the NMC Controllers in the field, and the NMCNet application running in your office. This is done mainly to prevent the need to open certain ports in the firewall – for increased security and ease of installation/configuration.

Once the iRCU application is installed – it runs as a service and loads up at startup (by default). No changes needs to be done, and the communication between the PC and the remote iRCU box is opened automatically, so all the user has to do it open the NMCNet application, and work with the remote NMC Controller as if it is connected to its direct serial port.

2 iRCU Application Description

The iRCU Application needs to be installed on your local PC (See Installation Notes section for more details).

The application screen is divided into several sections:

1. Service Control
2. Common Parameters
3. Advanced Parameters
4. Communication

Service Control:

The Service Control section has two buttons: Start/Stop.

(When the service is running then the Start button is disabled, when the service is not running then the Stop button is disabled)

When the Start button is pressed – the service will try to connect to the remote iRCU box which was chosen in the IRCU communication section.

If the iRCU Application is configured to start automatically (see "Advanced Parameters" section for more details). In this case the service will already be running when the user opens the iRCU application screen.

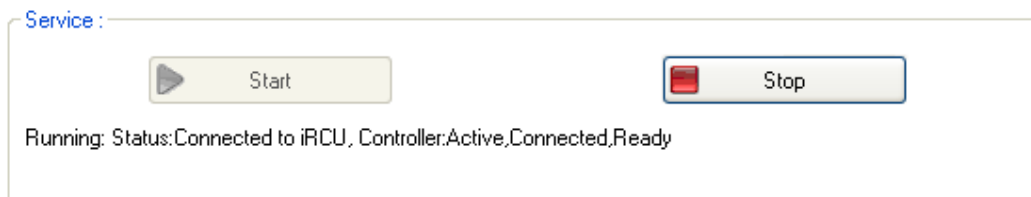
Beneath the buttons there is a status line. The status line shows the current status of the service, and communication to the iRCU box in the field.

Red color means there is an error, Black color is normal.

Please refer to [Appendix A](#) for a list of all Service Status messages.

Remark:

In general – the line that shows that everything is working and connection is ready should look like that:



(Common) Parameters:

The Parameters control can only be updated in "Edit" mode (after clicking the "Edit" button).

The parameters control is constructed of two sections:

1. Ports
2. Communication

This is how this part looks like:

Ports:

The Ports has two parameters: SMS Port, and Data Port.

Those ports are Virtual Ports (not actual ports on the PC), and the user can choose any port he wants from the list.

The important thing to remember is that the NMCNet application should use the same ports. The Data Port is the same port of the "Communications Ports" that is defined in the "Network Setup" of the NMCNet application.

The SMS Port is the same port of the Modem that is defined in the "SMS Setting" screen of the NMCNet application. The modem in the SMS Port should be the newly added "Bacsoft" modem from the list (NMCNet application version 4.01.82 and later).

The user must configure the serial ports in the iRCU Application before configuring the NMC (because the ports are virtual they will not appear in the NMC until they are configured in the iRCU Application)

Communication:

In this box the user defines which iRCU Box to communicate with.

The user should enter his username, password, and then open the "IRCU" dropdown. The Drop Down list is filled automatically from the Server, showing the list of authorized iRCU units for this user. The user should choose one unit from the list, and then press "Save" button.

Important Note:

The definition of the user/password and the units which is authorized for each user is done via "Bacsoft Administration" tool. There should not be a case that two different installations of iRCU application are configured to use the same iRCU Box. In a case like that communication to the unit will be transferred from one iRCU to another, causing both to constantly connect, and disconnect.

Advanced Parameters:

The Advanced Parameters screen is accessed from the "Advanced Parameters" button.

There are several sections in this screen:

- SMS Port definition
- Data Port definition
- Server's data (IP/Port)
- Service startup mode

In the SMS and Data Port definition, the user defines the Port definitions that should be equal to the port definition as defined in the NMCNet application. As explained before – the Port numbers should also be the same.

By default the Port definition is 9600/8/None/1/None.

Server's IP should remain as in the default installation. This is the actual IP and Port of the Server that connects between the Local Computer and the iRCU Box in the field. There is an option for Redundancy of Servers – thus the second Server line.

The Service checkbox is the option to automatically start the iRCU application at startup, or not.

This is how the screen looks like:

System Tray:

When the application is running and minimized a new icon will be shown in the status bar of Windows. The icon has two states – normal and error.

Icon looks like that:



- Error in Application.



- Application running normally.

Clicking on the "Exit" button in the iRCU application – shuts down the GUI application, but the Service will continue to run if it was in "Running" mode.

Clicking on the "X" (Close) button of the iRCU application is similar to minimizing the application (The icon will appear in the System Tray).

You can always re-open the iRCU window by selecting it from the Start Menu.

3 iRCU Application Installation Process:

Prerequisites:

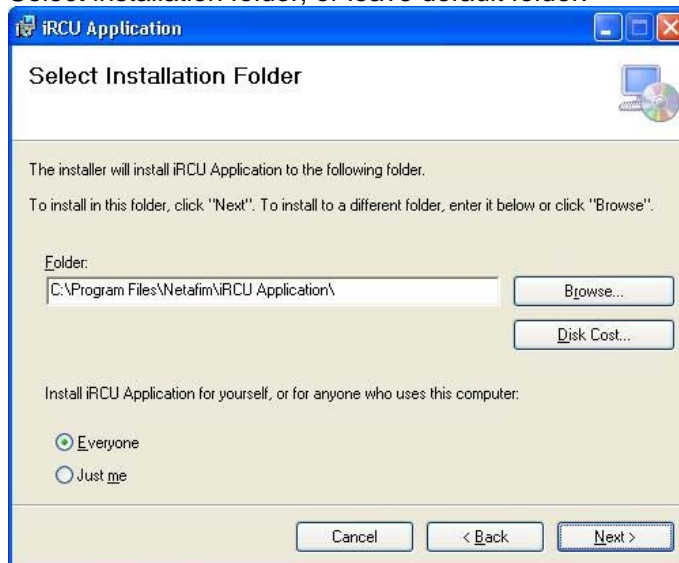
1. Internet connection with access to Netafim Server IP and Port
2. Administrator privileges on the local PC.
3. Installation files of iRCU application (setup file, msi file, .NET 4 installation file, Windows Installer) – all of those will be supplied on the installation CD.

Installation steps:

1. Double click on the iRCUApplicationSetup.exe.
2. On the first screen press "Next":



3. Select installation folder, or leave default folder:



4. The final stage of the installation is the iRCU parameters screen. The first time it opens, the user has to define the parameters relevant for him, as described in the iRCU parameters screen (User/Password/Unit selection and Ports configuration mainly).
5. To change parameters simply double click the iRCU application icon.

4 iRCU Box Description

General features:

- Quad-Band GSM 850/900/1800/1900 MHz
- GPRS multi-slot class 12.
- Mobile station class B.
- GSM release 99.
- Supply voltage range: 8 ... 30 V.
- Power consumption (at 12 V):
 - GPRS class 12: Average 170 mA, Max momentary 250mA.
- Temperature range:
 - Normal Operation: -20°C to +70°C
 - Switch off: +80°C
- Dimensions: 105x86x58.5
- Weight: 200 g

Interface:

- Serial:
 - COM1- RS232, DB9.
 - COM1- RS 485, Terminal Block. } SW configurable
 - COM2- RS 232, Terminal Block.
- I/O:
 - 8 isolated digital inputs.
 - Digital input number 8 could be a counter by SW configuration (see explanation below).
 - 2 digital outputs.
 - 2 analog input- 4-20ma / 0-10v.
 - 1 analog output- 4-20ma / 0-10v.
 - 12 bit A2D resolution (input and output).
 - SMA 50 Ω antenna connector.
 - Reset Button.
 - SIM card interface.
 - Plug in power supply.

LED indicators:



- INPUT: 1-8 isolated digital inputs.
- OUTPUT: 1, 2 digital output.
- COM1: Rx, Tx communication indicator.
- COM2: Rx, Tx communication indicator.
- DC IN:
 - ON – Main power supply indicator (+/-).
 - OFF – Auxiliary power supply (+/-).
- Reset Button- Reset application after three seconds pressed.
- GSM Signal:
 - Low signal strength, 5 to 10 rssi
 - Medium signal strength, 10 to 15 rssi
 - More than 15 rssi.
 - All LEDs power on circuit- Try to open GPRS channel connection.
 - All LEDs blinking- GPRS activated and registering to the server.
- STATUS:
 - Module- Power supplied to the module.
 - GSM/GPRS:
 - 600ms on/ 600ms off- No SIM card inserted, or network search in progress, or network login in progress.
 - 75 ms on/ 3s off- The mobile is registered to the GSM network.
 - 75 ms on/ 75 ms off/75 ms on/ 3s off- GPRS activated

Advanced:

- Digital input number 8 could be a counter by software configuration.

General Remarks:

1. iRCU box includes in addition 8 Digital Inputs, 2 Analog Inputs (0-10V, 4-20MA), 2 Digital Outputs, 1 Analog Output and one Digital Counter. All of those can be used to monitor or activate Door switches, Humidity/Temperature sensors etc and set alarms as SMS/E Mail messages to a user or a group of users.
2. iRCU boxes are connected to a central system which monitors their functionality. If an iRCU box is disconnected for some reason or has malfunction – the Central Server knows about it, and can notify user or group of users by sending them SMS or E Mail message.

3. iRCU boxes can be queried by SMS messages sent to them. You can query the iRCU box for its signal strength, SIM Card number, APN and much more.
4. iRCU boxes are controlled from a main system, and can be easily configured and monitored remotely, including remote firmware updates.
5. For further information about the iRCU box and its additional functionality please refer to the "iRCU Specification" document.

Hardwire Configuration to NMC Controllers

- The iRCU Box should be supplied with a black RS232 crossover cable.
- This cable should be connected to "COM1" of the iRCU Box, and the other end to the "Mux" or other RS232 input in the NMC Controller.

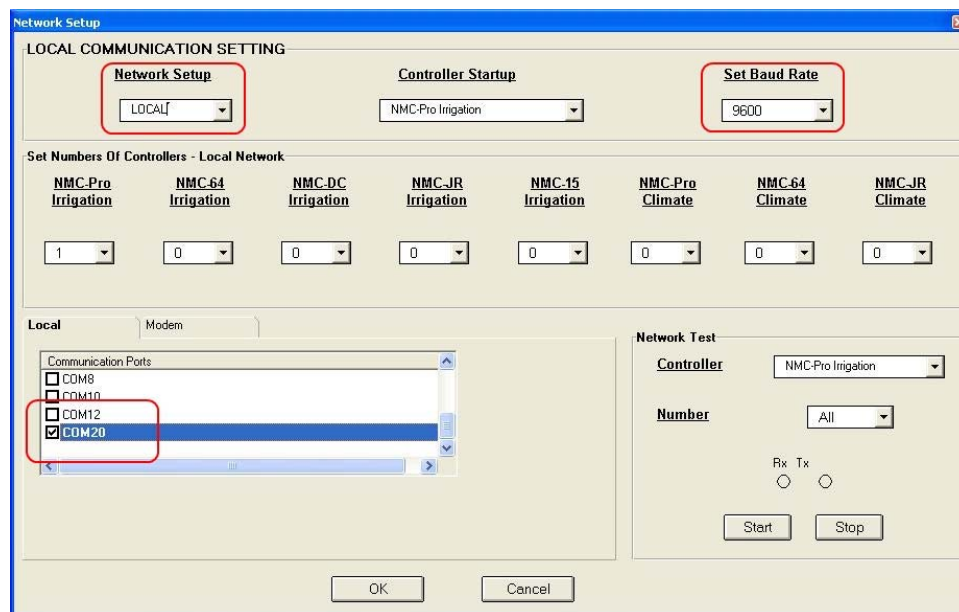
5 NMCNet Application Configuration

There are two places that you need to change in the NMCNet application:

1. "Network Setup" screen.
2. "SMS Setting" screen.

Network Setup Screen

- Open the "Network Setup" screen by clicking on the "Network Setup" option from the "Setup" menu.
- In this screen you should choose "Local" (not Modem anymore!) in the "Network Setup" option.
- Choose 9600 under the "Set Baud Rate" option.
- Select the Port Number from the list of available ports in the "Local" tab. You should choose the same port that was defined in the "iRCU Application" as the "Data Port".
- All the rest of the parameters on the screen should be set up normally.



SMS Setting Screen

- If you want to use the SMS options you first need to check the "SMS Active" checkbox.
- In the "Setting" – choose "Bacsoft" as the Modem type. (If you do not have "Bacsoft" option in the Modem type you are probably using an old version of the NMCNet, please check in the "Help->About" for version number. "Bacsoft" modem support appears in versions 4.01.82 and later).
- In the "Comm Port" drop down please choose the same Port Number as you chose in the "iRCU application" under the "SMS Port" option.

SMS Setting

This SMS feature must be used only as a secondary alarm system. It solely depends on the PC which might fail regardless to Netafim program and therefore cannot be trusted for alarm purposes.

SMS Active

Setting

Modem Type: Bacsoft

Comm Port: COM12

Send Info

No.	Name	Phone Number	Active
1	noanm		<input checked="" type="checkbox"/>
2			<input type="checkbox"/>
3			<input type="checkbox"/>
4			<input type="checkbox"/>
5			<input type="checkbox"/>
6			<input type="checkbox"/>
7			<input type="checkbox"/>
8			<input type="checkbox"/>
9			<input type="checkbox"/>
10			<input type="checkbox"/>

Send Alarm SMS Every: 30 Minutes

SMS Test: Active At: 09:55

Ok Cancel

Important Notes:

1. The configuration to the NMC Application should be done after installing the iRCU application, since the NMCNet application port configuration will have to use the Serial Port number which is defined in the iRCU Application.
2. You should have NMCNet Application version 4.01.82 or later.

6 Appendix A

Below is more detailed explanation about the different statuses as they appear in the iRCU Application status line:

Service Status:

- Stopped – Service is not running
- StopPending – Service is shutting down
- StartPending – Service is starting
- Running – Service is running

Communication Status:

- TCP: Connected – We have TCP Communication with the iRCU Box.
- TCP: Not Connected – There is no TCP Communication with the iRCU Box.

Controller Information:

- Active – Controller in the Server is enabled
- Not Active – Controller in the Server is disabled (or customer is disabled)
- Connected – iRCU Box is Connected to the Server
- Not Connected – iRCU Box is not Connected to the Server
- Not Ready – iRCU Box is connected to the Server, but is not ready for work (Server sends parameters to End Unit)

Errors:

- Failed to find controller ... - The controller configured in the iRCU Application does not exist in the server, or the user does not have permissions to access it.
- InvalidLogin - The user/password configured in the iRCU Application is not valid.
- UserAlreadyConnected - The user is already connected (need to make sure that each iRCU Application site has its own user in the Server and that it is not used for other things like Web Client).
- No connection could be made because the target machine actively refused it ADDR:PORT – wrong Address/port configured for server in the iRCU GUI.
- No such host is known - Address configured for server in the iRCU GUI is wrong (or there is a problem with the client's DNS settings)
- Failed to create Virtual Serial Port – Problem with installation of Virtual Serial Port or the Serial port already exists on the computer.