

NQ-Series HMI

INTRODUCTION MANUAL



Notice

OMRON products are manufactured for use by a trained operator and only for the purposes described in this manual.

The following conventions are used to classify and explain the precautions in this manual. Always heed the information provided with them.

- WARNING Indicates information that, if not heeded, could possibly result in serious injury or loss of life.
 - Caution Indicates information that, if not heeded, could possibly result in minor or relatively serious injury, damage to the product or faulty operation.

OMRON product references

In this manual the first letter of the name of each OMRON product is capitalized.

Visual aids

The following heading appears in the left column of the manual to help you locate different types of information.

- **Note** Indicates information of particular interest for efficient and convenient operation of the product.
- 1,2,3... Indicates various lists such as procedures, checklists etc.

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Revision history

SECTION 1 Precautions

This section provides general precautions for using the NQ-Series Operator Interfaces (OIs), Programmable Logic Controllers (PLCs) and related devices.

The information contained in this section is important for the safe and reliable operation of the NQ-Series terminal. You must read this section and understand the information contained before attempting to set up or operate an NQ-Series terminal.

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1-1 Intended audience

This manual is intended for the following personnel, who must also have knowledge of electrical systems (an electrical engineer or the equivalent).

- Personnel in charge of installing FA systems.
- Personnel in charge of designing FA systems.
- Personnel in charge of managing FA systems and facilities.

1-2 General precautions

The user must operate the product according to the performance specifications described in the operation manual.

Before using the product under conditions which are not described in the manual or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, and other systems, machines, and equipment that may have a serious influence on lives and property if used improperly, consult your OMRON representative.

Make sure that the ratings and performance characteristics of the product are sufficient for the systems, machines, and equipment, and be sure to provide the systems, machines, and equipment with double safety mechanisms.

This manual provides information for installing and operating the OMRON NQ-Series HMI (referred to as "HMI"). Be sure to read this manual before attempting to use the HMI and keep this manual close at hand for reference during operation.

- The HMI is a general purpose product. It is a system component and is used in conjunction with other items of industrial equipment such as PLC's. Loop Controllers, Adjustable Speed Drives, etc.
- A detailed system analysis and job safety analysis should be performed by the system designer or system integrator before including the HMI unit in any new or existing system. Consult your OMRON representative for options availability and for application specific system integration information if required.
- The product may be used to control an adjustable speed drive connected to high voltage sources and rotating machinery that is inherently dangerous if not operated safely. Interlock all energy sources, hazardous locations, and guards in order to restrict the exposure of personnel to hazards. The adjustable speed drive may start the motor without warning. Signs on the equipment installation must be posted to this effect. A familiarity with auto-restart settings is a requirement when controlling adjustable speed drives. Failure of external or ancillary components may cause intermittent system operation, i.e., the system may start the motor without warning or may not stop on command. Improperly designed or improperly installed system interlocks and permissives may render a motor unable to start or stop on command.

1-3 Safety precautions

- WARNING Do not attempt to take any HMI apart or touch any internal parts while the power is being supplied. Doing so may result in electric shock.
- WARNING Do not attempt to disassemble, repair, or modify any HMI. Any attempt to do so may result in malfunction, fire, or electric shock.
- WARNING Provide safety measures in external circuits, i.e., not in the HMI, in order to ensure safety in the system if an abnormality occurs due to malfunction of the HMI or another external factor affecting the HMI operation. Not doing so may result in serious accidents.
 - Emergency stop circuits, interlock circuits, limit circuits, and similar safety measures must be provided in external control circuits.
- WARNING Never short-circuit the positive and negative terminals of the batteries, charge the batteries, disassemble them, deform them by applying pressure, or throw them into a fire. The batteries may explode, combust or leak liquid.
- WARNING Fail-safe measures must be taken by the customer to ensure safety in the event of incorrect, missing, or abnormal signals caused by broken signal lines, momentary power interruptions, or other causes. Not doing so may result in serious accidents.
- WARNING The HMI will turn OFF when its self-diagnosis function detects any error. As a countermeasure for such errors, external safety measures must be provided to ensure safety in the system.
- WARNING Do not touch any of the terminals or terminal blocks while the power is being supplied. Doing so may result in electric shock.
 - **Caution** Pay careful attention to the polarities (+/-) when wiring the DC power supply. A wrong connection may cause malfunction of the system.
 - Caution Confirm safety at the destination HMI before transferring a program or settings to another HMI. Doing this without confirming safety may result in injury.
 - Caution Tighten the screws on the terminal block of the Power Supply connector to the torque specified in the operation manual. The loose screws may result in burning or malfunction.

1-4 Operating environment precautions

Caution Do not operate the control system in the following locations. Doing so may result in malfunction, electric shock or burning:

- · Locations subject to direct sunlight.
- Locations subject to temperatures or humidities outside the range specified in the specifications.
- · Locations subject to condensation as the result of severe changes in temperature.
- · Locations subject to corrosive or flammable gases.
- · Locations subject to dust (especially iron dust) or salts.
- · Locations subject to exposure to water, oil, or chemicals.
- · Locations subject to shock or vibration.
- Caution Take appropriate and sufficient countermeasures when installing systems in the following locations. Doing so may result in malfunction:
 - · Locations subject to static electricity or other forms of electric noise.
 - · Locations subject to strong electromagnetic fields.
 - · Locations subject to possible exposure to radioactivity.
 - Locations close to power supplies.
- **Caution** The operating environment of the HMI System can have a large effect on the longevity and reliability of the system. Improper operating environments can lead to malfunction, failure and other unforeseeable problems with the system. Make sure that the operating environment is within the specified conditions at installation and remains within the specified conditions during the life of the system. Follow all installation instructions and precautions provided in this operation manual.

1-5 Application precautions

WARNING Failure to abide by the following precautions could lead to serious or possibly fatal injury. Always read these precautions.

- Always connect to a ground of 100 Ohm or less when installing the HMI. Not doing so may result in electric shock. Always connect to a ground of 100 Ohm or less when short-circuiting the functional ground and line ground terminals of the Power Supply Unit, in particular.
- Always turn OFF the power supply to the HMI before attempting any of the following. Not turning OFF the power supply may result in malfunction or electric shock.
 - Mounting or dismounting Power Supply units and Control Units
 - Assembling option boards on HMI
 - Replace the battery
 - Setting switches
 - Connecting or wiring the cables
 - Connecting or disconnecting the connectors
- Check the user program for proper execution before actually running it on the HMI. Not checking the program may result in an unexpected operation.

Caution Failure to abide by the following precautions could lead to faulty operation of the HMI or the system, or could damage the HMI. Always read these precautions.

- Install external breakers and take other safety measures against shortcircuiting in external wiring. Not observing this may result in burning.
- Be sure that all the terminal screws and cable connector screws are tightened to the torque specified in the relevant manuals. Incorrect tightening torque may result in malfunction.
- Mount the HMI only after checking the connectors and terminal blocks completely.
- Before touching the HMI, be sure to first touch a grounded metallic object in order to discharge any static built-up. Not doing so may result in malfunction or damage.
- Be sure that the terminal blocks, connectors, and other items with locking devices are properly locked into place. Improper locking may result in malfunction.
- Wire correctly according to the specified procedures.
- Always use the power supply voltage specified in the operation manuals. An Incorrect voltage may result in malfunction or burning.
- Do not connect an AC power supply to the NQ-series HMI power terminals, an incorrect power supply may result in burning.
- Take appropriate measures to ensure that the specified power with the rated voltage and frequency is supplied. Be particularly careful in places where the power supply is unstable. An incorrect power supply may result in malfunction.
- Use crimp terminals for wiring. Do not connect bare stranded wires directly to terminals. Connection of bare stranded wires may result in burning.
- Disconnect the functional ground terminal when performing withstand voltage tests. Not disconnecting the functional ground terminal may result in burning.
- Wire correctly and double-check all the wiring or the setting switches before turning ON the power supply. Incorrect wiring may result in burning.
- Check that the switches and settings are properly set before starting operation.

- Resume operation only after transferring to the new HMI the contents of the all settings, programs, parameters, and data required for resuming operation. Not doing so may result in an unexpected operation.
- Do not pull on the cables or bend the cables beyond their natural limit. Doing either of these may break the cables.
- Do not place objects on top of the cables. Doing so may break the cables.
- Use the dedicated connecting cables specified in operation manuals to connect the HMI. Using commercially available RS-232C computer cables may cause failures in external devices or the NQ-series HMI.
- When replacing parts, be sure to confirm that the rating of a new part is correct. Not doing so may result in malfunction or burning.
- When transporting or storing the product, cover the PCBs with electrically conductive materials to prevent LSIs and ICs from being damaged by static electricity, and also keep the product within the specified storage temperature range.
- Do not touch the mounted parts or the rear surface of PCBs because PCBs have sharp edges such as electrical leads.
- Make sure that parameters are set correctly. Incorrect parameter settings may result in unexpected operations. Make sure that equipment will not be adversely affected by the parameter settings before starting or stopping the HMI.
- Do not press the touch switch with a sharp pointer or pencil, doing so may result in malfunction or damage.
- Do not press the touch switch with a force greater than 30N, doing so may result in malfunction or damage.
- Always following the specified procedure when removing the USB-stick. Removing the USB-stick while it is being accessed may render the USBstick unusable.
- Please make sure to have a backup of the data already present on the USB-stick before connecting it with NQ-series HMI. Not doing so may result in lost of data.
- Do not let metal particles enter the HMI when preparing the panel.
- Do not use benzene, paint thinner, or other volatile solvents and do not use chemically treated cloths.
- Carefully unpack the equipment and check for parts that were damaged from shipping, missing parts, or concealed damage. If any discrepancies are discovered, it should be noted with the carrier prior to accepting the shipment, if possible. File a claim with the carrier if necessary and immediately notify your OMRON representative.
- Do not install or energize equipment that has been damaged. Damaged equipment may fail during operation resulting in further equipment damage or personal injury.

1-6 Handling, storage and disposal

- Use proper lifting techniques when moving the HMI; including properly sizing up the load, and getting assistance if required.
- Store in a well-ventilated covered location and preferably in the original packaging if the HMI will not be used upon receipt.
- Store in a cool, clean, and dry location. Avoid storage locations with extreme temperatures, rapid temperature changes, high humidity, moisture, dust, corrosive gases, or metal particles.
- Do not store the HMI in places that are exposed to outside weather conditions (i.e., wind, rain, snow, etc.).
- Never dispose electrical components via incineration. Contact your state environmental agency for details on disposal of electrical components, batteries and packaging in your area.

1-7 Conformance to EC Directives

1-7-1 Applicable directives

- EMC (ElectroMagnetic Compatibility) Directives
- Low-voltage directive

1-7-2 Concepts

OMRON units complying with EC Directives also conform to related product standards making them easier to incorporate in other units or machines. The actual products have been checked for conformity to product standards. Whether the products conform to the standards in the system used by the customer, however, must be checked by the customer.

Product related performance of OMRON units complying with EC Directives will vary depending on the configuration, wiring, and other conditions of the equipment or control panel in which OMRON devices are installed. The customer must, therefore, perform final checks to confirm that units and the overall system conforms to product standards.

A Declaration of Conformity for the NQ-Series can be requested at your nearest OMRON representative.

1-7-3 Conformance to EC Directives

NQ-Series should be installed as follows, for the complete configuration to meet the EC directives:

- 1 The units are designed for installation in panels. All units must be installed in control panels.
- 2 Use reinforced insulation or double insulation for the DC power supplies used for the communication power supply, internal circuit power supply, and the I/O power supplies.
- 3 The NQ-Series meets the generic emission standard. However as EMC performance can vary in the final installation, additional measures may be required to meet the standards. It should therefore be verified that the overall machine or device also meets the relevant standards. You must therefore confirm that EC directives are met for the overall machine or device, particularly for the radiated emission requirement (10 m).
- 4 This is a class A product. It may cause radio interference in residential areas, in which case the user may be required to take adequate measures to reduce interference.

SECTION 2 Introduction

This section introduces the NQ-Series models and the specifications of the models.

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2-1 About this manual

This manual describes the installation and operation of the NQ-Series. The NQ-Series products are versatile Human Machine Interfaces (HMI).

Please read this manual carefully and be sure to understand the information provided before installing or operating the NQ-Series.

The program provided in this manual is given strictly as an example. When implementing an actual system, check the specifications, performance and safety instructions.

2-2 NQ-Series models

The NQ-Series are Human Machine Interfaces (HMIs) in three different display sizes and two orientation models. Models included in the NQ-Series are shown in Table 2.1: NQ-Series models. All models need +24 V_{DC} power from an external power supply.

Model	Description	Orientation
NQ5-TQ010B	5.7 inch TFT Colour, Ethernet	Landscape
NQ5-SQ000B	5.7 inch STN Colour	Landscape
NQ5-SQ001B	5.7 inch STN Colour	Portrait
NQ5-MQ000B	5.7 inch Monochrome STN blue mode	Landscape
NQ5-MQ001B	5.7 inch Monochrome STN blue mode	Portrait
NQ3-TQ010B	3.5 inch TFT Colour, Ethernet	Landscape
NQ3-TQ000B	3.5 inch TFT Colour	Landscape
NQ3-MQ000B	3.8 inch Monochrome FSTN Black / white mode	Landscape

Table 2.1: NQ-Series models



Figure 2.1: Front view of a NQ-Series with 5 function keys

2-3 Specifications for all models

Table 2.2: Common specifications for NQ-Series

Ρον	Power supply		
	Input voltage	24 V _{DC}	
	Tolerance on input voltage	+/- 15%	
Dis	play		
	Resolution (H * V) landscape models	320 * 240 pixels	
	Resolution (H * V) portrait models	240 * 320 pixels	
	Backlight life	Min. 50000 hours at 25°C	
	Backlight saver	Yes	
	Backlight dimming (NQ3)	Using touch screen / Function Keys	
Τοι	ich screen		
	Туре	4-wire analogue resistive	
	Light transparency	Min. 80%	
	Life	Min. 5 million touches	
Nu	mber of LEDs	1	
Communication interfaces			
	RS-232/422/485	Yes	
	USB device	Yes	
	USB host	Yes	
Pro	cessor	32-bit RISC (ARM)	
Rea	al-Time Clock (RTC)	Yes (date and time)	
Ме	mory		
	Data register	1000	
	Retentive register	1400	
	Internal coil	5000	
	Internal register	313	
Bat	Battery		
	Туре	3 V coin battery, with holder	
	Battery back-up	Min. 5 years for RTC	
Mounting			
	Method	Panel mounting	
	Enclosure rating	Front panel: IP65	

Environment	
Ambient operating temperature	0 °C to 50 °C
Operating environment	No corrosive gasses
Storage temperature	-20 °C to 60 °C
Humidity	10% to 90% ¹ relative humidity (Noncondensing) 10% to 85% ² relative humidity (Noncondensing)
Noise immunity	Conforms to IEC61000-4-4, 2 KV (power lines)
Vibration resistance (during operation)	5 to 8.4 Hz with 3.5 mm single amplitude and 8.4 to 150 HZ with 9.8 m/s ² accelera- tion 10 times in each of X, Y and Z direc- tions
Shock resistance (during operation)	147 m/s ² 3 times in each of X, Y and Z directions
International standards	·
Directives	CE, cULus, Lloyds

1. At 25 °C ambient temperature.

2. 85% at 40 °C ambient temperature. Above 40 °C the equivalent absolute humidity is less than 85%.

2-4 Specifications per model

Table 2.3: Specifications per NQ-Series model

Model	NQ5- MQ000B/ NQ5- MQ001B	NQ5- SQ000B/ NQ5- SQ001B	NQ5- TQ010B	NQ3- TQ000B	NQ3- TQ010B	NQ3- MQ000B
Display						
Display size	5.7 inch	5.7 inch	5.7 inch	3.5 inch	3.5 inch	3.8 inch
Display type	STN	STN	TFT	TFT	TFT	STN
Monochrome/colour	Mono	Colour	Colour	Colour	Colour	Mono
Colours supported	16 gradations	256 colours ¹	256 colours ²	256 colours ²	256 colours ²	4 gradations
Brightness (Cd/m ²)	Min. 200	Min. 200	Min. 200	Min. 200	Min. 200	Min. 160
Contrast ratio	4	55	350	300	300	3
Contrast adjustment using touch screen	Yes	Yes	No	No	No	Yes
Backlight types	CCFL	CCFL	LED	LED	LED	LED
Touch screen size	5.7 inch	5.7 inch	5.7 inch	3.5 inch	3.5 inch	3.8 inch
Function keys	6	6	6	5	5	5
Memory						
Total (MB)	8	8	8	8	8	4
Program (MB)	6.7	6.7	6.7	6.7	6.7	2.6
Communication interfaces	1	•	-	-		- <u>-</u>
RS-232/485/422 port (Com 1)	Yes	Yes	Yes	Yes	Yes	Yes
RS-232 port (Com 2)	Yes	Yes	Yes	No	No	No
Ethernet port	No	No	Yes	No	Yes	No
Power rating (W)	10	10	10	10	10	10
Weight	0.7 kg max.	0.7 kg max.	0.7 kg max.	0.3 kg max.	0.3 kg max.	0.3 kg max.
External dimensions	•	•	•	•	•	•
Width * Height (mm)	195 * 142	195 * 142	195 * 142	128 * 102	128 * 102	128 * 102
Thickness (mm)	50	50	50	44.5	44.5	44.5

1. 4096 colours for bitmaps

2. 32000 colours for bitmaps

SECTION 3 Installation and wiring

This section describes how to install the NQ-Series and how to wire the HMI.

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3-1 Installation notes

For improved reliability and maximized functionality, take the following information into consideration when installing a NQ-Series HMI.

3-1-1 Location

Do not install the NQ-Series in the following locations:

- Areas subject to explosion hazards due to flammable gasses, vapours and dusts.
- Areas subject to dramatic temperature changes. Temperature changes can cause condensation of water in the device.
- Areas with an ambient temperature lower than 0 °C or higher than 50 °C.
- Areas subject to shock or vibration.

3-1-2 Temperature control

- Provide adequate space for air flow.
- Do not install the NQ-Series above equipment that generates significant heat.
- If the ambient temperature exceeds 50 °C, install a cooling fan or air conditioner.

3-1-3 Accessibility

For safety during operation and maintenance, mount the NQ-Series as far as possible from high-voltage equipment and power machinery.

3-1-4 Panel cut-out

Before the NQ-Series can be mounted, a rectangular cut-out must be made in the panel in which the NQ-Series will be mounted. Table 3.1: Dimensions of NQ-Series and required panel cut-out shows the dimensions and tolerances of the NQ-Series, the panel and the required cut-out.

		NQ5-	NQ3-
Display size		5.7 inch	3.5 inch and 3.8 inch
External dimensions:	W _{ext}	195 mm	128 mm
	H _{ext}	142 mm	102 mm
Panel cut-out: W _{cut-out}		184.00 mm	119.00 mm
	H _{cut-out}	131.00 mm	93.00 mm
Panel cut-out tolerance		+0.50 mm	+0.50 mm
Panel thickness		Max. 6.0 mm	Max. 6.0 mm

Table 3.1: Dimensions of NQ-Series and required panel cut-out

Above external dimensions and cut-outs are for landscape models. For portrait models exchange the W and H sizes. For portrait models the cables will be mounted to the left side of the NQ-Series (view from front).



Figure 3.1: Dimensions of NQ-Series and required panel cut-out (landscape).

3-2 Mounting

The NQ-Series has been developed for panel mounting. Delivered mounting set with each NQ-Series contains:

- 4 mounting clamps
- A green power connector
- A sealing gasket (already mounted on the NQ)

Use the delivered mounting set for proper installation. After the preparation of the panel, the NQ-Series can be mounted using the supplied clamps. The NQ-Series comes with a gasket pre-installed behind the bezel, as shown in Figure 3.2: NQ-Series with gasket and mounting clamp slots.



Figure 3.2: NQ-Series with gasket and mounting clamp slots

Mount the NQ-Series as follows.

- 1 Locate the four mounting clamp slots in the case of the NQ-Series. The NQ3 models have their slots located at the side surfaces of the case (as shown in Figure 3.2: NQ-Series with gasket and mounting clamp slots. The slots of the NQ5 models are located at the top and bottom surfaces of the case.
- 2 Keep the four mounting sets at hand. Each set consists of a screw (1), a clamp (2) and a cap (3) as shown in Figure 3.3: Mounting hardware set.



Figure 3.3: Mounting hardware set

- 3 Insert the case into the cut-out in the panel, from the front side of the panel.
- 4 Insert a clamp into a mounting clamp slot on the case and tighten the screw slightly as shown in Figure 3.4: Case being fixed in panel.



Figure 3.4: Case being fixed in panel

- 5 Repeat previous step for the other three clamps.
- 6 Hold the NQ-Series straight and tighten all four screws evenly to a torque between 0.5 Nm and 0.6 Nm.

3-3 Wiring

NQ-Series models have, besides one power connector, a number of communication ports. Please refer to Table 2.2: Common specifications for NQ-Series and Table 2.3: Specifications per NQ-Series model for the availability of these ports on each of the NQ-Series models.

- WARNING Connecting high voltages or AC power mains to the DC input will make the NQ Series unusable and may create an electrical shock hazard to personnel. Such a failure or shock could result in serious personal injury, loss of life and/or equipment damage. DC voltage sources should provide proper isolation from main AC power and similar hazards.
 - Caution If wiring is to be exposed to lightning or surges, use appropriate surge suppression devices. Keep AC, high energy and rapidly switching DC wiring separate from signal wires.

3-3-1 Power connector

All NQ-Series models have a 3-pin, Green coloured, power connector with pin layout as shown in Figure 3.5: Power connector. Wire the inputs of the power connector according to the pin layout, from left to right: +24 V_{DC} (DC+), 0 V (DC–) and Earth.



Figure 3.5: Power connector

3-3-2 Communication ports

The NQ-series supports different types of communication ports. Depending on model there are Ethernet and/or serial ports available.

These ports have two functions:

- 1 Connect to programming devices during configuration.
- 2 Communicate with a PLC and other devices in operating mode.

3-3-2-1 COM1 port

COM1 is an integrated RS-232 and RS-485/RS-422 communication port. It communicates with external peripherals devices at baud rates of 4800 kbps to 187.5 kbps with none, even or odd parity.

RS-485/RS-422 can be used in multi-drop (networks with more than one NQ-Series or PLC) communication networks.

The connector is a standard D-type 9-pin female connector (see Figure 3.6: 9-pin sub-D connector) with pin layout as shown in Table 3.2: Pin layout of port COM1.



Figure 3.6: 9-pin sub-D connector

Pin number	Pin name	Description
1	TX+	RS-422 transmit +
2	TXD	RS-232 transmit
3	RXD	RS-232 receive
4	RX+	RS-422 receive +
5	GND	Signal Ground
6	NC	Not connected
7	NC	Not connected
8	TX–	RS-422 transmit -
9	RX–	RS-422 receive -
shell		shield

Table 3.2: Pin layout of port COM1

Note

NQ3-TQ010B and NQ5-TQ010B have built-in termination resistor switch for correct termination of RS422/RS485 networks.

3-3-2-2 COM2 port

COM2 is a RS-232 communication port. It communicates with external peripherals at baud rates of 4800 kbps to 115.2 kbps with None, Even or Odd parity.

The connector is a standard D-type 9-pin female connector (see Figure 3.6: 9-pin sub-D connector) with pin layout as shown in Table 3.3: Pin layout of port COM2.

Pin number	Pin name	Description
1	NC	Not connected
2	TXD	RS-232 transmit
3	RXD	RS-232 receive
4	NC	Not connected
5	GND	Signal Ground
6	NC	Not connected
7	NC	Not connected
8	NC	Not connected
9	NC	Not connected
shell		shield

3-3-2-3 USB host port

The USB host port is compliant with the USB 2.0 specification. The USB host port supports USB memory stick devices. The USB sticks can be used for data logging and program upload/download, and carrying print files in CSV format.

The connector is a standard USB type A female connector as shown in Figure 3.7: USB host connector.



Figure 3.7: USB host connector

Pinning of the USB host port is described in the table below.

Table 3.4: Pin layout of USB host port

Pin number	Pin name	Description
1	VBUS	+5V
2	D-	Data -
3	D+	Data +
4	GND	Signal ground
shell		shield

3-3-2-4 USB device port

The USB device port is compliant with the USB 2.0 specification for self-powered devices.

The connector is a standard USB type B female connector as shown in Figure 3.8: USB device connector.



Figure 3.8: USB device connector

Table 3.5: Pin layout of USB device port

Pin number	Pin name	Description
1	VBUS	+5V
2	D-	Data -
3	D+	Data +
4	GND	Circuit ground
shell		shield

Wiring

3-3-2-5 Ethernet Port

Several NQ-Series models have next to the serial ports also an Ethernet port. This port is a shielded RJ-45 female jack with built-in speed and link activity indication LED's.

The Ethernet port supports:

- 10/100 Mbps Ethernet networks
- Upload/download programs
- Auto-crossover function



Figure 3.9: Ethernet Port

Table 3.6: F	in lavout	of Ethernet	port
10010 0.0.1	mayour		P 0

Pin number	Signal name	Description
1	TD+	Twisted-pair output (differential output)
2	TD-	Twisted-pair output (differential output)
3	RD+	Twisted-pair input (differential input)
4	BI_D+	Protection circuit
5	BI_D-	Protection circuit
6	RD-	Twisted-pair input (differential input)
7	BI_D+	Protection circuit
8	BI_D-	Protection circuit

Led definition:

- Green: link / activity indication
- Yellow:
 - On =100 Mbps

- Off = 10 Mbps

3-4 Multi-drop networks

Several NQ-Series can be set up in a network. The following wiring diagrams show the correct connections:

- RS-422 network
- RS-485 network

3-4-1 RS-422 network

The following wiring diagram is applicable for a RS-422 network (4-wire).



Figure 3.10: RS-422 network

3-4-2 RS-485 network

The following wiring diagram is applicable for a RS-485 network (2-wire).



Figure 3.11: RS-485 network

3-4-3 Network termination

RS-422/RS-485 networks are balanced networks. This means that for stable connections both ends of a multi-drop network have to be terminated with the same resistor. Correct terminating a NQ, you must add a resistor on to the male D-SUB9 connector of the communication cable connected to COM1. This termination resistor must be applied between R+ (Pin 4) and R- (Pin 9).

For OMRON products commonly a termination resistor of 220 Ohm is used.

NQ3-TQ010B and NQ5-TQ010B provide a termination resistor switch for COM1 which is located under the central lid shown in below [figure 3.12]. When switched ON the RS-422/RS-485 network will be terminated with a resistor of 220 Ohm.



Figure 3.12: Position of termination resistor switch

Note When termination is switched ON for RS-422/RS-485 communication the RS-232 communication for COM 1 will not work anymore.

Always check your network that the termination resistors at both ends of the network are the same.

SECTION 4 Creating applications

This section describes how to create programs for the NQ-Series.

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4-1 Preparing for programming

4-1-1 NQ-Designer

NQ-Designer is used to create and modify user interfaces for the NQ-Series. The user interface is created in the software and downloaded to the device. Existing user interfaces can be uploaded to the software and be modified as required. The software can also be used in a simulation mode to test the program without downloading the program to the NQ-Series.



Figure 4.1: NQ-Designer

4-1-2 System requirements

The following basic PC hardware configuration is needed to install and use NQ-Designer.

4-1-2-1 Microsoft® Windows® XP configuration

Table 4.1: Windows® XP configuration

Device	Recommendations
Processor	Minimum: 600 MHz Pentium processor or equivalent processor
	Recommended: 800 MHz Pentium processor or equivalent processor
Operating System	Windows® 2000 with SP4, Microsoft® Windows® XP Professional Microsoft® Windows® XP Home Edition with SP2
System RAM	Minimum: 128 MB
	Recommended: 256 MB/512 MB
Hard Disk Space	800 MB (including 200 MB for the .NET Framework Redistributable)
Display	Minimum: 800 x 600 with 256 colours
	Recommended: 1024 x 768 with 16 bit colour quality
Serial Port	Serial port or USB port

Device	Recommendations
Mouse	Microsoft® Mouse or compatible pointing device
Keyboard	Required

4-1-2-2 Microsoft® Windows® Vista configuration

Table 4.2: Windows® Vista configuration

Device	Recommendations
Processor	Minimum: 800 MHz Pentium processor or equivalent processor
	Recommended: 1 GHz Pentium processor or equivalent processor
Operating System	Microsoft® Windows® Vista Home SP1 Microsoft® Windows® Vista Business Edition SP1
System RAM	Minimum: 512 MB
	Recommended: 1 GB
Hard Disk Space	800 MB (including 200 MB for the .NET Framework Redistributable)
Display	Minimum: 800 x 600 with 256 colours
	Recommended: 1024 x 768 with 16 bit colour quality
Serial Port	Serial port or USB port
Mouse	Microsoft® Mouse or compatible pointing device
Keyboard	Required

4-1-2-3 Microsoft® Windows® 7 configuration

Table 4.2: Windows® 7 configuration

Device	Recommendations
Processor	Minimum: 1 GHz Pentium processor or equivalent processor as long as it satisfies all other requirements
	Recommended: 1GHz Pentium processor or equivalent processor as long as it satisfies all other requirements
Operating System	Microsoft® Windows® 7 Professional Microsoft® Windows® 7 Ultimate editions
System RAM	Minimum: 1 GB (32-bit) and 2 GB (64-bit)
	Recommended: 1 GB (32-bit) and 2 GB (64-bit)
Hard Disk Space	800 MB (including 200 MB for the .NET Framework Redistributable)
Display	Minimum: 800 x 600 with 256 colours
	Recommended: 1024 x 768 High Colour 16-bit
Serial Port	Serial port or USB port
Mouse	Microsoft® Mouse or compatible pointing device

Device	Recommendations
Keyboard	Required

4-1-3 Installing the software

To install NQ-Designer run **setup.exe** from the installation disc and follow the installation instructions.

4-1-4 Connecting the NQ-Series power supply

Connect a 24 V_{DC} power supply to the NQ-Series.

4-1-5 Connecting the NQ-Series to a PC

The NQ-Series can be connected to a PC with the following programming cables:

- USB cable (CP1W-CN221)
- Ethernet cable
- Serial cable (NT2S-CN002)

Refer to Appendix A-1 OMRON communication cables and Appendix A-3 Non-Omron devices communication cables for more information on cables.

4-1-5-1 USB cable

In order to use a USB cable the USB driver needs to be installed on the PC operating system. Perform the following steps to install the USB driver.

- 1 Connect the USB cable to the PC and NQ-Series.
- 2 When the PC detects the NQ-Series the following message is displayed: Found New Hardware: HMI USB Device. On the dialog select Found New Hardware Wizard, No, not this time and click Next (It depends on the environment whether the message is displayed or not.).
- 3 Select Install from a list of specific location and click Next.
- 4 Ensure that **Include this location in the search** is checked and browse to the following location:
- C:\Program Files\OMRON\NQ-Designer\USBDrivers\
- 5 Click **Next** to install the USB driver.
- 6 If the Hardware Installation dialog is displayed, click Continue Anyway.
- 7 Click **Finish** to complete the installation.

A correct installed driver will show a message on the NQ-Series' screen: **USB device status: Connected** (This message is only shown when no firmware is downloaded in the NQ).

4-1-5-2 Ethernet cable

NQ3-TQ010B and NQ5-TQ010B models are equipped with an Ethernet port. This Ethernet port allows you to connect via Ethernet to PLC or other devices. Mentioned NQ-Series with build-in Ethernet can act as FINS client or as FINS server. They support 10MB and 100MB, Full duplex networks and Autocrossover function. Below figure 4.2 shows the default Ethernet settings defined for NQ HMI.



Figure 4.2: Port configuration

Next to the IP address, subnet mask, download port and gateway there is also an option/check box for DHCP.

DHCP option work as follows:

When checked, the NQ will on power-up wait for an IP address to be assigned. If there is no DHCP server on the network the NQ will use the IP address defined as in the above configuration window.

When powering on the NQ you will see a message if DHCP server is available and which IP address is assigned to NQ.

When unchecked the NQ will use the defined IP address and will not look for a DHCP server.

4-1-5-3 Serial cable

The serial cable can be used directly after connecting the cable.

4-2 Using NQ-Designer

4-2-1 Starting NQ-Designer

Select **Start**, **Programs** or **All Programs**, **Omron** and click on **NQ-Designer** to start the program.

4-2-2 NQ-Designer program window

Opening a project or creating a new project will show the below programming window on your Personal Computer.



Figure 4.3: NQ-Designer program window

4-2-2-1	Title bar	The title bar displays the name of the program and the selected part of the project.
4-2-2-2	Menu bar	The menu bar contains the program commands.
4-2-2-3	Toolbars	The toolbars contain shortcuts to all program functions.
		To display the tool tips hover over the icons in the toolbars.
		On the View menu click Toolbars to hide or show a toolbar. The toolbars supporting drag and drop functionality.
4-2-2-4	Project panel	
		The project panel shows the structure of the program. From the project structure the project is managed and the project parts are set and configured.
		On the View menu click Projects Information to hide or show the project panel.
Project list

The Project list contains all saved projects. The project file extension is .nqp.

Creating or opening a project will show the root folders described below.

Screens

The **Screens** folder contains one base screen and four predefined keypad screens that can be used in the project. For every screen the following parts can be configured:

- Layout: graphical representation of the screen
- Keys: function keys used in this screen
- Tasks: assigned tasks to the screen
- Password: a password can be assigned to pages that must be entered before the page can be accessed.

Keypad screens and screens numbered 65000 and higher are assigned as pop up screens. If a new popup screen is added to the project the screen will be located here.

Functions that can not be assigned to pop up screens are:

- Goto next screen
- · Goto previous screen
- Open popup screen (it is not allowed to chain pop up screens)
- Data entry objects (triggers a keypad, which is a popup screen)
- · Password protection

Templates

The **Templates** folder contains the created template screens. Template screens are screens that can be added to a base screen. Template screens are always placed behind the base screen. These screens usually contain keys, buttons or background images that are used frequently in the project.

Following objects can not be assigned or are conditional to template screens:

- Data Entry on PLC tags
- Keypads placed on template screens act on numerical input of the base screen
- Screen tasks (Before showing, while showing, after hiding tasks)
- Key specific tasks
- Passwords

Using templates will also positively influence the usage of the memory and reduce the programming time. (You re-use screens that you have programmed before and assign them to different base screens).

To add a template proceed as follows:

Global Keys

The **Global Keys** folder can be used to assign tasks to global keys. Global keys are running cyclic for the whole project. The following tasks are available:

- Press Task (tasks executed while pressing the key)
- Pressed Tasks, (tasks executed while holding the key)
- Released Tasks (tasks executed while releasing the key)

Please note that when key tasks are assigned to screen keys the global keys will not be executed, e.g. global key F1 = add 1 to D000, and screen key F1 = subtract 1 from D000 then subtract 1 is active for this screen when pressing F1.

Tasks

On the **Tasks** dialog the **Power On** tasks and **Global** tasks can be configured. The **Power On** tasks are executed once the NQ-Series starts up. The **Global** tasks are executed every cycle of the program. The task list can contain more than one command.

Global tasks that most common used are:

Copy RTC to PLC (this copies the NQ-Series' RTC data to assigned PLC tags (7 sequential tags)).

If the program contains many global tasks it can influence the performance of the NQ-Series.

Tags

The folder **Tags** shows all tags that can be used in the project. The folder contains the following tags: system tags (default set), internal tags (NQ tags) and PLC tags created by users.

Tags represent the addresses(bit, byte, word, double word registers) that will be used in a project.

To add a tag proceed as follows.

- Goto screen 1
- Click Tag () in the toolbar and click Add....

2 Fin 2 Fin 4 RT 5 Co 8 Co 8 Nu 7 So 8 Nu 7 So 8 RT	rgivitgt uh Henory Status Cr Fal mi Post Status mber Of Historical Alams seen Taccas Registra	1940 1940 1940 1940 1940	\$0801 \$0802 \$0803_08 \$0803_02 \$0803_02	0454 V V	Operator Panel Operator Panel Operator Panel	Tag Tage Default Tag Default Tag Default Tag	
2 Log 4 Rf 6 Co 6 Nu 7 So 8 So 9 RT	oger Menney Full Status C.Fail m1 Post Status mber Of Historical Alema	22540 24560 24560	\$0003_00 \$0003_02		Openator Panel	Default Teg Default Teg	
4 Rf 5 Co 6 Na 7 So 8 So 9 RT	C Fail m1 Peet Stakas mber Of Historical Alarma	HMU	\$0003_02				
5 Co 6 Na 7 So 8 So 8 RT	m1 Pint Status ander Of Historical Alarma	HMU					
6 Na 7 So 8 So 9 R1	ender Of Historical Alarma		000000 14		Operator Panel	Delaul Tag	
7 So 8 So 9 AT		1.000 000	DLMM13_14		Operator Panel	Default Tag	
i So i At	neer Tricces Receive	HIME	\$0004	2	Operator Panel	Default Tag	
9 87		HIME	\$0005	2	Operator Panel	Delaut Tag	
	soon Saver Tase	14940	\$0008	2	Operator Panel	Defaul Tat	
10 87	CDay	HING	\$2010	2	Operator Panel	Default Tax	
	CHooth	SHMI.	\$30011	2	Openator Panel	Dolast Tap	
11 RI	CYear	S-EMAIL	\$0012	2	Operator Panel	Default Tag	
12 81	CHeur	S-IMI	S0013	2	Operator Panel	Default Tag	
12 81	Chin	SAME.	S0014		Operator Panel	Default Tag	
14 RI	CSec	54ME	\$0015		Openator Panel	Default Tag	
	C Day of week	HIME	S0016	2	Openator Panel	Default Tag	
	an Time Registering	HMI	S0017	2	Openator Panel	Default Tag	
17 Co	mmunication Recover Ti	14140	S0018	2	Openator Panel	Default Tag	
18 De	ver Scan Time Register	HMI	50829	2	Operator Panel	Default Teg	
19 Per	allo Somen Trigger Reg	HIME	50823	2	Openalcy Panel	Default Tag	
20 De	currence Alam Number	PEME	\$0835	2	Operator Panel	Default Tag	
	childrees Cartesi	HMI	\$0422	2	Operator Panel	Default Tag	
	rate Change Palae	HME	10003	1.0	Operator Panel	Default Tag	
23 Ho	kat Change Palae	HME	10004	140	Operator Panel	Default Tag	
	te Change Palee	HMI	10005	140	Operator Panel	Default Tag	
25 Ma	with Change Pulse	HMI	10005		Openator Parent	Default Tag	
25 Ye	ar Change Pulst-	HME	\$0807	1 m	Operator Panel	Default Tag	12
10.PC	ON SHORE REACTING	12474	10.69765		Service of the last	and the second se	

Figure 4.4: Tag information

- Enter Tag Name.
- Select Register/Coil Type.
- Select Tag Type.
- Select Auto Add to create a number of tags in sequence increasing by word or by bit depending on tag choice. (names can be edited afterwards)
- Select 2-Bytes (1-word).

Default system tags

The following tables contain the default system tags. Do not attempt to modify or delete the system tags. This could affect the functionality of the NQ-Series.

On the toolbar you find a button (\blacksquare) that allows you to display all tags or user created tags shown in your tag list.

Register	Tag name	Read/Write	Description
S0001	Language	Read/Write	Writing a value will change languages in multi language supported objects (texts).
S0002	Flash memory status	Read	Shows percentage used of logger memory.
S0004	Number of historical alarms	Read	Shows number of alarms stored in history.
S0005	Screen trigger register	Read/Write	Shows active screen. Change screen by writing a valid screen number in the register.
S0006	Screen saver time	Read/Write	The screen saver time (Sec) can be changed during operation.

Table 4.3: Default system tags (words)

Using NQ-Designer

Register	Tag name	Read/Write	Description
S0008	IP Conflict Status Register	Read only	If there is an IP Conflict then 1 is written to this register. If there is no IP conflict then by default it is zero.
S0009	Driver Scan Time Register [ms]: Ethernet	Read only	Shows time required to execute Screen blocks in milliseconds. Use ####.# format for display for Ethernet drivers
S0010	RTC day	Read	RTC day in BCD format
S0011	RTC month	Read	RTC month in BCD format
S0012	RTC year	Read	RTC year in BCD format
S0013	RTC hour	Read	RTC hour in BCD format
S0014	RTC min	Read	RTC minute in BCD format
S0015	RTC sec	Read	RTC second in BCD format
S0016	RTC day of the week	Read	RTC day of week in BCD format 1 = Sunday 2 = Monday 3 = Tuesday 4 = Wednesday 5 = Thursday 6 = Friday 7 = Saturday
S0017	Scan time register	Read	Shows time required to execute screen, screen task and global task in millisecond. Use ####.## format for display.
S0018	Communication recover time[s] for port1	Read/Write	Shows time in seconds to recover the communication with failed nodes for port1. The default value is 60 sec.
S0019	Communication recover time[s] for port2	Read/Write	Shows time in seconds to recover the communication with failed nodes for port2. The default value is 60 sec.
S0020	Driver scan time register for port1	Read	Shows time required to execute screen blocks in milliseconds. Use ####.## format for display.
S0021	Driver scan time register [ms] for port2	Read	Shows time required to execute screen blocks in milliseconds. Use ####.## format for display.
S0023	Popup screen trigger register	Read/Write	Holds the screen number for the pop-screen that will be shown when bit s20 bit is set.

Register	Tag name	Read/Write	Description
S0028	HMI IP Address [LS Byte]	Read only	IP ADDRESS Lower word
	HMI IP Address [2nd Byte]	Read only	IP ADDRESS Lower word
S0029	HMI IP Address [3rd Byte]	Read only	IP ADDRESS Higher word
	HMI IP Address [MS Byte]	Read only	IP ADDRESS Higher word
S0030	HMI Subnet Mask [LS Byte]	Read only	HMI Subnet Mask Lower word
	HMI Subnet Mask [2nd Byte]	Read only	HMI Subnet Mask Lower word
S0031	HMI Subnet Mask [3rd Byte]	Read only	HMI Subnet Mask Higher word
	HMI Subnet Mask [MS Byte]	Read only	HMI Subnet Mask Higher word
S0032	HMI Default Gateway [LS Byte]	Read only	HMI Default Gateway Lower word
	HMI Default Gateway [2nd Byte]	Read only	HMI Default Gateway Lower word
S0033	HMI Default Gateway [3rd Byte]	Read only	HMI Default Gateway Higher word
	HMI Default Gateway [MS Byte]	Read only	HMI Default Gateway Higher word
S0034	HMI Download Port	Read only	NQ download Port
S0035	Occurrence alarm number	Read/Write	Occurrence Count of Alarm Number present in S0035 will reset to zero when coil s0044 is SET
S0121	Contrast control (Retentive register)	Read/Write	This retentive register used for setting the contrast of the NQ-Series.
S0122	Brightness control (Retentive register)	Read/Write	This retentive register used for setting the brightness of the NQ-Series.

Table 4.4: Default system tags (Bit)

Register	Tag name	Read/Write	Description
S0003_00	Logger memory full status	Read	1: full memory
S0003_02	RTC fail	Read	RTC fail (contents of registers not within defined ranges e.g. minutes>60)
S0003_13	Ethernet Port Status	Read only	0: Communication Error, 1: Communicating with PLC
S0003_14	Comm1 status	Read	0: communication error 1: communication OK
S0003_15	Comm2 status	Read	0: communication error 1: communication OK

Using NQ-Designer

Register	Tag name	Read/Write	Description
s0003	Minute change pulse	Read	1 for every change in minute for one scan cycle
s0004	Hour change pulse	Read	1 for every change in hour for one scan cycle
s0005	Date change pulse	Read	1 for every change in date for one scan cycle
s0006	Month change pulse	Read	1 for every change in month for one scan cycle
s0007	Year change pulse	Read	1 for every change in year for one scan cycle
s0008	Screen saver control	Read/Write	0: disable screen saver 1: enable screen saver This bit can be changed in during operation
s0009	Beeper on/off	Read/Write	0: disable beeper 1: enable beeper This bit can be changed during operation.
s0010	Battery status	Read	0: battery voltage is OK 1: low battery (below 2.2 V)
s0012	Update the historical trend	Read/Write	Update the historical trend window when set to 1
s0014	Acknowledge all alarms	Read	0: all alarms are acknowledged 1: all alarms are not acknowledged in the real and historical alarms
s0016	Valid key beeper	Read/Write	0: disable valid Function key beeper 1: enable valid Function key beeper This bit can be changed during operation
s0017	Invalid key beeper	Read/Write	0: disable valid screen beeper 1: enable valid screen beeper. When set to 0 the NQ- Series will only generate a beep when an input area is pressed. This bit can be changed during operation

Register	Tag name	Read/Write	Description
s0019	Invalid date entry	Read	0: valid date 1: invalid date (range not within defined ranges e.g. month > 12)
s0020	Popup screen control coil	Read/Write	Triggers the popup screen number stored in S0023
s0021	Communication recover enable bit: port1	Read/Write	If this bit is set communication with the failed nodes is detected after scan time S0018 for port1 (on by default)
s0022	Communication recover enable bit: port2	Read/Write	If this bit is set communication with the failed nodes is detected after scan time S0019 for port2 (on by default)
s0023	Communication recover enable bit: Ethernet port	Read/Write	If this bit is set communication with the failed nodes is detected after scan time S0020 for Ethernet port (on by default)
s0028	Bittask datalogger-logger group1 bit	Read/Write	User can start/stop logging in bit task mode for group1 by using this bit. 1: Start logging 0: Stop logging
s0029	Bittask datalogger-logger group2 bit	Read/Write	User can start/stop logging in bit task mode for group2 by using this bit. 1: Start logging 0: Stop logging
s0030	Bittask datalogger-logger group3 bit	Read/Write	User can start/stop logging in bit task mode for group3 by using this bit. 1: Start logging 0: Stop logging
s0031	Bittask datalogger-logger group4 bit	Read/Write	User can start/stop logging in bit task mode for group4 by using this bit. 1: Start logging 0: Stop logging

Using NQ-Designer

Register	Tag name	Read/Write	Description
s0032	Lock data entry	Read/Write	User can lock/unlock the data entry (keypad entry). 0: data entry unlock 1: data entry lock
s0033	Start data entry only through enter key	Read/Write	User can choose the mode of data entry using this bit. 0: allow data entry through enter key or numeric key 1: allow data entry only by pressing enter key first
s0035	Ignore real and historical alarms	Read/Write	0: Monitor all alarms 1: Ignore all real and historical alarms
s0036	Run LED on/off	Read/Write	0: Run Led is On 1: Run Led is Off
s0037	Allow USB host operation	Read/Write	0: USB host operation not allowed 1: USB host operation allowed.
s0042	HMI DHCP Enable/ Disable	Read only	DHCP Enable/Disable
s0043	Logged Data Clear Bit	Read/Write	Clears the Data Logged if this bit is Set
s0044	Occurrence Reset bit	Read/Write	The control coil for resetting occurrence of alarms (ON = reset)

Nodes

The **Nodes** folder contains the information of your network: the name of the panel and PLCs, node addresses in the network (listed under COM1 or COM2), protocol used on the COM port. COM1 and COM2 can have different protocols.

In this folder you can also add a node to your network.

- Click Nodes (<u></u>).
 Right-Click on screen.
- Select add Node.

4-2-2-5 Alarms

The alarm folder contains the configurator for adding changing and defining alarms.

The alarm functionality allows you to choose from three different methods.

- 16 Random words For each TAG (word) 16 alarms can be configured / assigned in the alarm window. A total of 16 different words (= 256 alarms) can be configured / assigned.
- 16 consecutive words This function will be accessible after 16 consecutive word tags have been created in tag database. This alarm method will create 256 alarm lines at once in the alarm window.
 - 256 discrete alarms This function combines the creation of independent discrete bit or conditional alarms.
 - Discrete bit alarms

Each bit defined in tag list can be selected as an alarm bit. For each "bit" alarm you can select whether it should act on "rising edge" or "falling edge".

· Conditional alarms

With conditional alarms you can generate an alarm based on the values from two different registers or generate an alarm by comparising the value of a tag (registers) compared to a defined value. Based on the definition an alarm will be raised if the logic condition defined is "true". Possible conditions are:

- < smaller then
- > larger then
- <= smaller then and equal to
- >= larger then and equal to
- == equal to
- != Not equal to

The bit and conditional alarms can both be used at the same time.

Section 4-2

Ackin	onledge Al	I Alams On	BMCol HR0005	0_00(ACK PLC BK)	2				Chang	e Picpeifec
Alan	n Section	[outo:	08-0851	AlamNunter 2		Tag List	HR00010	(Alem gro.	e.1.•	Antige
	Alam Anign	Alam Number	Tag_Bit	Alam Text	Log	Severity	Plint	Ack. Tag		
	Yes	0	Alam group_1_0	Mator stopped	Yes	1	No	Yes		
	Yes	1	Alam group_1_1	Fuse blown	No	0	No	Yes		
	Yes	2	Allem group_1_2	No water precise	Yes	2	No	Yes		
	Ne	3	Alam group_1_3	Alarm Text3	No	0	No	Yes		
	No	4	Allarm group_1_4	Alam Text4	No	0	No	Yes		
	No	5	Alam group_1_5	Alarm Text5	No	0	No	Yes		
	Na	6	Alam group_1_6	Alam Text6	No	0	No	Yes		
	No	7	Alam group_1_7	Alarm Text?	No	0	No	Yes		
Alam	Description	·					Lang	Ange		Update
Alter	nTest N	o watar pra	soure			Engl	sh (United	States)	*	Delete
- 44	m Notice		Altern Sevente			History D	escription			- Voiere
	Pieł		In the second because which is the	Sel Paramete	n	12 Hot		Acknowles	-	Reast.A Alams
	lanalidge Actornel		Koi Tap	-			Constant and	knowledge	35/3	Export
1126										Import

Figure 4.5: Alarm project configuration properties

Above screen will show when clicking the alarm folder in project tree.

From top to bottom this window can be divided in three areas.

1. Alarm type

This area is the main configuration part of the alarm configuration window. It shows you the selection made in the alarm tab, when you create a new project.

Alarm type: default selection is 16 random words.

Note: It is allowed to change format from 16 random words and 16 consecutive words to 256 discrete alarms. Other format conversions will reset the defined alarms.

Furthermore it shows the action performed when the alarm memory in NQ-Series is full Lower section of area 1 is how alarms can be Acknowledged.

Current view shows that all alarms will be acknowledged by setting the ACK PLC bit. Second possibility here will Acknowledge alarm by selection. If this is selected each alarm can be ACK by a tag defined in area 3 (ACK window).

Note: When pressing button "Change properties" all already assigned alarms will be erased and set to default.

2. Address assignment

This area allows you to assign the alarms. In alarm section you can define 16 groups. Each group will be assigned to a register (Word) and can contain 16 alarms. Depending on Alarm type selected in Area 1 the number of alarms will be reserved in the alarm window when pressing assign. For example 16 consecutive words will reserve 256 alarms at once, For 16 random words it will be 16 and for 256 discrete alarms it will be 1.

3. Definition of each alarm

This area allows you to define each alarm from text message (maximum 40 characters), severity, real/historical alarm, print and acknowledging (depending on acknowledge defined in area 1).

Set parameter button allows you to define the text of Acknowledged and active fields per language. Each language will contain it's own defined confirmation and can when programmed be different for each of the used languages.

After entering the correct definition for each alarm the button "accept" must be pressed to validate the alarm. Created alarms can be changed of name or format. After making the change "accept" must be pressed.

For assigning the alarm register that will be used to trigger alarms a tag has to be created in tag list.

Example:

HR000 is the alarm register used in the PLC program. Create a tag with HR000 in your tag list. Select this created tag and assign the alarm register. Upon assigning you will see that the first 16 lines are now identified as alarms. Bit HR000.00 as alarm 0 (Motor stopped), bit HR000.01 as alarm 1 (Fuse blown), etc.

Clicking on alarm 0 first line allows you to enter the alarm text, acknowledge (Y/N) and which bit should be used to perform ACK, severity, real time alarm or Historical alarm.

When all of these settings are made you click button ACCEPT. You see now all text turns blue and alarm sign has changed to YES.

With this method you can assign all alarms used in your project.

Important buttons are explained below for assigning alarms.

Update	
Delete	
Reset All Alarms	
Export	
Import	

Figure 4.6: Alarm buttons

- Update will update the change you have applied to the alarms
- Delete will delete the alarm line you have selected.
- Reset all alarms will reset all settings in alarms. All will be cleared including the selected register for alarms
- Export will export all text used in alarms to CSV for creation of Multilanguage application.
- Import will import the modified CSV file for multilanguage in the project.

4-2-2-6 Data Logger

The data logger allows users to log data (tags) in the NQ-Series over time. The data logger folder contains the set-up/configuration for data logging and data logging printing.



Figure 4.7: Data logger

The memory size reserved for logging data in the terminal can be selected. Several ranges can be selected from 256Kb to 2048Kb.

For memory full there are 2 possible selections how NQ-Series should behave:

• FIFO

This is the default setting. The FIFO function will, if set, erase the oldest 64kb of the datalogger file. This is a continuous process that allows you to have always the latest logger information.

Example: you have selected 256kb as logger data file. As soon as S0002 (flash status) reached 100%, the first entries occupying 64 KB will be removed and S0002 will be set to 75%.

For 512kb this will be 88%, 1024KB will be 94% and 2048KB will be 97% Stop logging

This setting will stop the log function when S0002 reaches 100%.

For logging the data type (word / double word) can be selected. Upon this selection the tags available for logging will then be filtered to what can be chosen for logging.

The data logger allows a user to define 4 different groups. Each group can contain of 30 tags that can be logged. For each group a logging mode can be defined.

The datalogger can handle 6 different logging modes.

Power up

•

Each tag defined in this group will be logged when terminal is powered and application is running. The logging frequency for this group can be set.

Start / Stop time User can define on which part of the day the logging must occur. Also with this option the logging frequency can be programmed for the whole group when choosing this mode.

Key task User can assign keys / buttons to start and stop logging. The commands can be found under "Keys specific Task" selection.

 Logging with run time frequency This mode can only be used for group 1 and is intended for datalog printing only. When selected this option each tag will be logged with a selectable interval of minimum 30 minutes.

Bit task

User can use the system bits s28 (group1) to s31 (group4) to start or stop logging. If system bit is set to 1 logging starts.

Event based User can select an internal bit for logging. There are 3 options to select. : Positive edge, Negative edge, Both edges. When selecting each of these options the logging will start / stop on the selected conditions.

4-2-2-7 Languages

The **Languages** dialog shows the supported languages and manages the languages supported by the project. To support a language the language needs to be added to the program. NQ-Designer supports a total of 9 languages. The default language of the program is the default language of the operating system.

Recover Language (Investige County) Inth (Index) Internet Index) Index (Index) (Index		1728	English (United States) Spawah (Span) taken (Rely)
ок	Cancel Hulb	Note: Che	Date Format Separator Format DO/Hel/YY - ChDex is provided for helpback anabier/dea

Figure 4.8: Languages

To add a language proceed as follows.

- Select the language from the Supported Languages list and click Add.
- Each language can be individually programmed so that the correct date format and separator can be displayed in the NQ-Series.
- · Check the checkbox to enable keyboard layout for the selected language.

In the language folder you will see S0001 displayed. In front of each added language a value is shown. If the value in register S0001 is set to the value shown in front of the added language the project will then be displayed in the selected language.

First language shown in the language folder is the default language of your Windows operating system. Languages can be added or removed from this folder.

If you use the import/export tool for entering multiple languages you do not need to enable the keyboards in this folder. A keyboard can be enabled if you add the language to your Windows operating system. Languages can always be added to the program in a later stage.

Creating a multi language application import / export functionality for translation you will always have to export and import 2 different files. Text objects (Import / export text objects in Toolbar) AND Alarm objects (in alarm folder).

4-2-2-8 Workspace

The workspace is used to create and edit the projects. The properties panel displays the properties of the settings. The properties can be changed by clicking the properties' value.

4-2-2-9 Status bar

The status bar contains additional information regarding scratch pad area and the screen area coordinates. The scratch pad area is the total screen area available for programming.

4-2-2-10 Properties window

The properties window shows the properties of the selected object. Properties that can be changed by user are displayed in **bold**.

4-2-3 Using the help function

The help function is displayed by clicking **Software help** or **Contents** on the **Help** menu.

4-3 Example application

4-3-1 Project settings

- 1 Start NQ-Designer.
- 2 Click Create New Project or click Create New NQ Project on the Project menu under New.

Select Model		×
Product :	NQ3	▼
Model :	NQ3-TQ000-B	
Details:	Resolution:	320 x 240
Details:	Display Size:	3.5"
	Colour Supported:	256
	Function Keys:	5
	Ports:	1 Serial Port, USB
	COM1:	Yes
	COM2:	No
	Ethernet:	No
	OK	Cancel

Figure 4.9: Select model

Example application

3 Select **NQ3** in product pulldown list. Select **NQ3-TQ010B** as model type. Click **OK**.

Preject Title :	Uriting2	Nate 45 charact	wol:
Save in Directory :	C:/Program Files/JOMRO	NVNO Cresquer/Sample	NUnted: Boxes
Description :			
Autor:	(Lpt	n 45 characteri)	
Pasioned:	(Liph	o 9 characters)	
toduct information Product: NO3	10000.0		
Hodel Details	190909		
Rectation :	320×240		Inage
Display Size :	15		
Color Supported			
Function Keys:			
Posts :	1 Sexial Flot, Etherret, U	ise:	-
COMT	Ves		
C0M2	Ne		
	Ves		

Figure 4.10: Project information

- 4 Enter the following project data:
 - Project title: Example
- 5 Click **COM1** tab.

Postacul: Omo	oNT Link (134)	Hodel	CPIL	2
Comunication S	elings			
BaudRate:	15.2K ·	DeleDito	1	
Party: 1	141 F	River Rev	F	-
				Adheb
Produst: NQ3 Hodel Details Resclution	320 × 240		r I	la superior de la competition de la comp
Display Size :				
Color Supported :				
Function Keys.:				
	1 Senal Fort, Ethernet, 1	U\$8		· · · · · · · · · · · · · · · · · · ·
CONT	Ves			
COM2: Ethanal	No			
	Ves			

Figure 4.11: COM1

- 6 Enter the following communication settings:
 - Protocol: Omron NT Link
 - Model: CP1L
 - Baud Rate: 115.2K
 - Data Bits: 8
 - Parity: Odd
 - Stop Bits: 1
- 7 Click Add Node.

8 Click Alarm tab.

Toreina)	eer Enable IIII († 5402)	Options during Doverland IF Exam Data Larges Memory IF Exam Metanical Alarm Data IF Doverland Tagramme
odust Internation Yodvet NO Hodel Details Resolution Display Size:	320 x 240	- Insp
Color Supported:		
Function Keys:		±
Fundian Keya: Pota : COHT : COHT :	1 Serial Plat, Etherret, USB Ves	

Figure 4.12: Alarm

- 9 Enter the following alarm settings:• 16 random words: Each bit of each random assigned word is an alarm 10 Click Settings tab.

Scens Save Sal Tore (cost)		Options skuling Disordiaad IF Exam Data Lacype Memory IF Exam Historical Alam Data IF Download Tag rumm
todust information Produst NO2 Model Details Peacebaien Darling Scie Color Supported Franklers Keys Polis COM1 COM2 Ethomat	320×240 1.5" 256	ing.

Figure 4.13: Settings

- 11 Enter the following settings:Screen Saver Enabled

Example application

12 Click Screen Navigation tab



Figure 4.14: Screen Navigation

13 Select the control method for base screen and or popup screen navigation.14 Click **OK**.



Figure 4.15: NQ-Designer screen

Refer to 4-2-2-4 Project panel for information on the project panel content.

4-3-2 Screen functionality

NQ-Designer automatically generates 5 screens:

- 1 base screen for programming
- 4 predefined keypad screens (pop-up screens)

The properties window can be used to change the properties. Properties displayed in bold can be changed. The most important properties are as follows:

- Tasks List
- Use Template

Proceed as follows:

- 1 Double-click **Screens**. Click **Screen1**.
- 2 Click ... from Tasks List in the property panel.
- 3 Select task from pulldown menu.
 - For each screen you can define if actions should be made before , during or after closing the screen

4-3-3 Multilingual text objects

Multilingual text objects are used to display texts. This object should be used when programming a multilingual application. The most important properties are as follows:

- Visibility Animation
- Font
- Flash
- Text Colour

Proceed as follows:

- 1 Click Multilingual Text (🔊).
- 2 Draw the multilingual text object on Screen1.
- 3 Press the space bar. This will open a field in the Status Bar of NQ-Designer. This will allow you to enter text immediately.



Figure 4.16: Multilingual text objects

4-3-4 Data entry objects

Data entry objects will use a keypad to change data. In the property box a popup screen (keypad screen is automatically assigned with respect to format used). If the user wants to add a keypad to base screen to change an input, the setting keypad should be set to NO in the numerical input configuration

Data entry objects are used to enter:

- numerical data
- bit data

The most important properties for numerical data are as follows:

- Tag Address (register)
- Tag Name
- Data Type (unsigned, hex, binary, etc.)
- Format (4,2) total 4 digit of which are 2 behind the delimiter (**,**)

Example application

The most important properties for bit data are as follows:

- Off Text
- On Text
- Keypad

Proceed as follows:

- 1 Right-click on **Screens** folder in project panel.
- 2 Click New Base Screen ().
- 3 Click on Screen2.
- 4 Click Numerical Data Entry (🔤).

Screen [1: Screent]		Register Test DeployOata	Properties	×
	1	E 21 22 39 E		
		🗄 Display Data Properti		
1213127		Tag Name	Language	
886		Tag Addess	\$0001	
000		Ranges	1	
		E Animation		
		Coloue Animation	No	
		Flesh Animation	No	
		Visibility Animation	No	
	100	E Appearance		
		Background Colour	0 75	
		Roder	None	
		Flath	No Flash	
		Fart	517	
		Text Colaut		
		Ton Coller		
99999 data display same as Numerical input				
		Background Coke Sets the background colou	of the selected science (Nis is a	to the

Figure 4.17: Data entry objects

Note Right lower field shows explanation of field selected in property box.

4-3-5 Display data objects

Display data objects are used to display:

- numerical data
- message data
- bit data

The most important properties for numerical data are as follows:

- Tag Address
- Tag Name
- Data Type

The most important properties for message data are as follows:

- Ranges
- On Text
- Tag Address
- Colour/Flash/Visibility Animation

The most important properties for bit data are as follows:

- Off Text
- On Text
- Tag Address
- Colour/Flash/Visibility Animation

Proceed as follows:

- 1 Right-click on **Screens** folder in project panel.
- 2 Select New Base Screen (=)
- 3 Click on Screen3.
- 4 Click Numerical Data Display (🔄).
- 5 Click on Screen3.
- 6 Click Message Data Display (🛅).
- 7 Click 1 from Ranges in the property panel.



Figure 4.18: Display data objects

8 Click **Add**. (ranges can be modified to desired values)

Register Text Range			×
	Low Limit	High Limit	Text
Range 1	0	100	On
Range 2	101	101	Check output
•			•
	Add	Delete Close	e Help

Figure 4.19: Register text range

4-3-6 Buttons

Buttons are used to assign tasks. The following buttons are available:

- Predefined buttons (🔄 🛤 🖬 💿 👁 🚢 📮 🛱 🛱 🐻 💿 👒 🗭) Buttons to which predefined single tasks can be assigned..
- Advanced bit button (
) Free configurable bit buttons with feedback option. The following behaviour can be programmed: press (rising edge), pressed (high) and released (falling edge).
- Word button (
)

 Buttons that can be configured on 32 states referenced to the value of the used tag defined for each state. Different tasks and messages can be assigned to each state of a word button.

The most important properties for buttons, advanced bit buttons and word buttons are as follows:

- Button Style
- On Text

•

On Text Colour

Proceed as follows:

- 1 Click on Screen3.
- Click Word Button ().
 (Pressing the space bar will allow you to enter text directly.)
- 3 Click Collection from State Properties in the property panel.
- 4 Click Add State.



Figure 4.20: Word button

- 5 Click ... from Tasks List in the property panel.
- 6 Click Add.

Example application

Section 4-3

State 1 [0, 0] State 2 [1, 1]		12 21 II.	
assess [1. 1]		Display Test	Yes
		Test Font	Word Button Arial: 12pt
		Test Colour	0
		Text Background	
		Button Style	Genetic Square
		Butten Border Sta	
		Low Lmt	1
		High Limit	1
		Tasks List	1 Tasks
	Delate State		r of tasks associated with the allows new or existing tasks to be o

Figure 4.21: State properties

- 7 Click **OK**.8 Click **OK**.

4-3-7 Lamp objects

The following lamp objects can be used:

Bit lamp (💡)

•

•

Bit lamp objects are used to display the on and off state of a coil type tag. Word lamp (\bigcirc)

Word lamp objects are used to display multiple states (max. 32) depending of the value of the assigned address.

The most important properties for bit lamp objects are as follows:

- Tag Address
- Style (generic, images, etc.)
- On Text Colour

The most important properties for word lamp objects are as follows:

- Tag Address
- State Properties

Proceed as follows:

- 1 Click Screen3.
- 2 Click Word Lamp (🍚).
- 3 Click on Screen3.
- 4 Click ... from **State Properties** in the property panel.
- 5 Click Add State.
- 6 Click OK.



Figure 4.22: Lamp objects

Graphical objects 4-3-8

The following graphical objects can be used to draw objects and place pictures on the screen:

- ٠
- Line (🍾) Rectangle (💷) •
- Ellipse (💽) •
- Rounded rectangle (🧖) •
- Advanced picture (•

All imported pictures are converted to BMP before downloading the pictures to the NQ-Series. This means that GIF and JPEG pictures will be converted to BMP resulting in a bigger memory use.



Figure 4.23: Graphical objects

4-3-9 Wizards

The following wizards can be used to add functionalities:

Bar graph (📒)

•

•

- To display a value by means of a bar.
- Multiple bar graph ()
 - To display values by means of max. 4 bars in one graphic. Each bar can be defined with different min. and max. values and assigned to different addresses. See image attached with multiple bar graph properties selected.
- Analogue meter ()

To display a value by means of a meter.

- Trend (📓)
- To display a value over a period of time in a diagram.
- Historical Trend (
 isa)

To display the trend of logged data. This command can only be used if a tag is logged in data logging. A maximum of 4 logged tags can be shown in the historical trend.



Figure 4.24: Wizards

4-3-10 Alarms

Alarm windows are created for displaying alarms on screen. The most important properties for alarms are as follows:

- · Alarm Type (real time or historical)
- · Select Display Fields (what is shown and order)

Proceed as follows:

- 1 Click Screen.
- 2 Click Alarm (🌉).

To define the alarm see Alarms in 4-2-2-4 Project panel.

- 3 Click Collection from Select Display Fields in the property panel.
- 4 Select **On-Time and Off-time** and click **Add**. The order of data shown in the window can be configured here.



Figure 4.25: Alarms

5 Click OK.

4-3-11 Keypad

Keypads can be used on a popup screen or on the base screen. If used on a popup screen the keypad will behave exactly the same as the predefined keypads in NQ-Designer.

If the keypads are placed on a base screen where also an input is placed (select No keypad in the property box), the keypad will change the data of this input. If a keypad is placed on a base screen with more input fields it will change all input fields on that screen one by one. To enable the keypad on a base screen press **ENT** or one of the numeric keys. The first numerical input will start to flicker. Now you can start entering the data.

The following keypad can be used:

•

- Keypad (🗐) This keypad is a numeric keypad that provides different styles of displaying keypads.
- ASCII keypad () This keypad is an ASCII keypad. There are two keypad styles: ASCII (Style 1) and ASCII numeric (Style 2).
 Custom keypad ()
- Custom keypad (📰) This keypad can be selected to create a custom numeric or ASCII keypad. The format can be freely chosen. This means merging keys, number of keys. Assignments for keys can be chosen in the property box.

4-4 Printing from NQ-Series

With the NQ-Series it is possible to print data on a serial printer. After adding the serial printer in the nodes folder (add node) it is possible to print, screen data, alarm messages and data logger information.

The printer will be visible in the nodes folder (added to network).

In the NQ-Series, application tasks can be assigned to perform the print actions.

Print screen data:

There are two ways to print screen data.

- Screen print properties from property list.
 Selecting the option "print screen" or "print once and display screen" will print the screen information every time you navigate to this screen.
- A button or Function key with task "Print data". Every time the Function key or the button is pressed the screen data of the current screen will be send to the printer.

Print alarm messages:

While defining alarms you can select for each alarm, if this alarm should be printed (Alarm notification, check print box). Each time an alarm (bit) is changed and print box is checked the alarm data will be send to the printer. The alarm data send to the printer is below fixed format:

Format = Time: Date: alarm number: alarm text: active /inactive:

Print data logger information:

In the Data Logger folder you can define four groups of tags to be logged. After adding tags in a group a button "Print Properties" is available to define the tags to be printed and the format.

Select in the Logged tags section the tags that you want to have printed. The tags selected will be visible in the Tags to be Printed window. You can change the header name, width, format for each the tag to be printed. If required this can be repeated for each group.

To be able to print the correct information a time window must be defined. The definition of the window can be defined in tab "Start / end times for printing" in the Datalogger window

A data logger print action requires a button added to your screen and assign the "key specific task" Start Printing of Group. Define here the group to be printed.

Pressing this button will now print the data logger information within the timeframe you have defined in data logger section.

Text printed will be ASCII characters only.

4-5 Model conversion in NQ-Designer

In NQ-Designer it is possible to convert a created project for a "specific" model into a different model. This can be from NQ3 to NQ5 or from Serial to Ethernet. This tool allows you to convert a project created from 1 model to any other model of the NQ-Series products.

Example:

A NQ3-MQ000B application can automatically be converted to any other model from the NQ-Series (NQ3* or NQ5*). This includes serial to Ethernet, com1 to com 2, etc. The whole project will automatically be converted to the desired model / configuration.

How to use:

•

- Open the project to be converted
- · Go to Project, Model conversion



Figure 4.26: Model conversion

• A screen is displayed showing the model of your current application and drop down box to select the new model.

Destination Mode	Selection	× lot ×
Source project model	Mara_Marao_E	
Select destination product	NQS	-
Select destination model	NQ5-TQ010-8	-
Save an	Г	Browse.
	Next C	ancel

Figure 4.27: Destination Model Selection

After selecting the new model you need to provide a name and destination for the saved project. ("save as" type should be nqp files (*.nqp)

Pressing "Next" button displays the selection made and a comparison of resolution of original model and new model.

wert Application		
Resolution		
NQ3_HQIOL_B	320	
NQ5_TQ010_8	320	
NQ3_MQ001_B	240	
NQ5_TQ010_B	240	
Select your choice of action		
🗭 Keep same size		
Delete object il goes i	outside active screen area	
🗖 Scan test divert ann		
-		
		1
	Previous Next	Cancel

Figure 4.28: Convert Application

Important in this window are the option/check boxes with actions perform while converting. For horizontal model to horizontal model conversion these settings should not have any effect as all NQ-Series have the same resolution. When a conversion is made from horizontal to vertical with incorrect settings objects can be deleted, misplaced in the converted project.

 Pressing "Next" button displays the selection made and a comparison of colors supported.

Convert Application		
Color		
NQ3_MQ000_8 supported color	4	
NQ5_TQ000_B supported oxier	256	
	Next	Cancel

Figure 4.29: Convert Application

Pressing "Next "will show you the communication port selection.
 Here you can select which communication port should be used in the new

Model conversion in NQ-Designer

•

application. Required here is to press "Add action" Selecting the communication port



Figure 4.30: Convert Application

 Again pressing "Next" will show a screen where Fkeys (function keys) can be mapped. If original model and new model have the same number of Fkeys this area will be greyed out.

onvert Application		_i=1×
Functional Keys		
NQ2_MQ000_8 supported keys	F1.F2.F3.F4.P5	
NQ5_TQ010_8 supported lugs	F1. F2. F3. F4. F5. F6	
C EL	C 14	
e a	C (5)	
C 73		
The key mapping sell be as FG->Default	FT-FT, F2+F2, F3+F1, F4+F4, F5+F1	i) E
	Previous Finish	Cancel

Figure 4.31: Convert Application

Pressing "Finish" will start the conversion process. The project will be converted. After conversion the "new" application will be opened and ready for download. On the bottom you will see a message appear that firmware always needs to be downloaded to the terminal again.

4-6 Connecting NQ-Series to OMRON products

4-6-1 NQ-Series and FINS.

Supported protocol on the NQ*-TQ010B Ethernet terminals is the OMRON protocol FINS over UDP.

The NQ-Series can act both as client and server.

When operating the NQ-Series as server following commands are implemented:

- FINS Read memory 0101
- FINS Write memory 0102
- FINS Identification 0501

The internal Data memory (D) of NQ-Series is reserved for NQ-Series as server function. These addresses can be reached by requesting CIO FINS data.

Maximum 1000 addresses can be used to exchange data.

Sending FINS Identification (0501) command will return a string of 40 characters with Type name of terminal followed by V XX.YY . In which XX is.... and YY is.....

E.g. "NQ3-TQ010-B V01.00"

Relaying data to other networks using FINS:

FINS data can be relayed through different network. Details how to relay data can be found in OMRON manual W342-E* (reference manual, communication commands)

Below a screen shot of the screen which allows you to set these parameters.

4-6-1-1 NQ-Series with OMRON FINS over Ethernet to OMRON Ethernet modules.

To perform a successful communication to OMRON CJ2 or C*1W-ETN* modules proceed as follows:

- 1. Create a new project in NQ-Designer.
- 2. Select the correct model to be used.
- 3. Go to Ethernet tab and make there the proper settings for the Ethernet data for NQ-Series. Defaults displayed are factory settings of the NQ-Series.

Carrow Al		emet Alam Se			
Post settings					
P DHOP					
IP Address	192.168	. 250 . 100	Subnet Mask	255 . 255 .	255.0
Download Port	5000		5) Default Galeway	0.0.	0 0

Figure 4.32: Project Configuration, Ethernet tab

- 4. Press OK.
- 5. A project is created.
- 6. Go to the nodes folder in the tree and ADD a node. Following screen will show.

ode Information Kame	PLC_1		Max 15 choxacter	Addess	1	(1 to 32)
ritestionen Dielogr	0	(01030	Contraction and	Response Time Dut	800	(109 to 6000) ms
Retry Court	3	(0165	E.		PLC Spec	in Settion
elect Photocol -	Etremet		Pick	scol FINS over U	DPAP	•
			Mod	no Verenner		-
FINS Source Ad Network: 0 Node 1	크	FINS Deatin Network Node Unit Addres	0 국 0 국	Padder		168 . 250 . 12

Figure 4.33: Node Information

- 7. Fill in the PLC name , if required
- 8. Port, select ETHERNET
- 9. Protocol, select FINS over UDP/IP
- 10.Model, select CJ1/CJ2/CP1
- 11. Destination, fill in here the IP address of your PLC you want to communicate with.
- 12.Click ADD
- 13.You have now made the settings for the NQ-Series (IP 192.168.250.100) to communicate with PLC (IP 192.168.250.12) using FINS.
- 14.Go to the taglist and create a PLC tag (HR000 as an example)
- 15.Goto screen 1, add a numerical input and assign it to HR 000

- × USE IP Address 192 . 168 . 250 . 100 -Part Number 5000 164 Response Timeout 20 120 - 65535 Sec) Options Application Fart Fart Fattersare P Ethemet Setting: Former Alem Das Close this close box when download completer Close Hab **Detions** < c Download ody
- 16.Download the application AND firmware to the NQ-Series using serial, USB or ethernet connection.

Figure 4.34: Communication, Ethernet

- Note: If you have changed the Ethernet settings in Project configuration, you also need to download the Ethernet settings in the download windows. Downloading the data using the Ethernet connection be aware the IP and port number in the Download window are exactly the same as IP and port number of the NQ-Series. (Power on the NQ-Series and on startup the current IP address of the NQ-Series will be displayed)
- 17.Open CX-Programmer and connect to the CPU.
- 18.Click the IO table
- 19.Go to the Ethernet module and double click
- 20.Attached screen shot is for CJ2MCPU3* PLC

IP Address		Net use DNS		
Use the following.	addess	C Use DNS		
IP Address	192 . 168 . 250 . 12	Primary DNS Server	0 0 0	. 6
Submet Mask	255 . 255 . 255 . 0	Secondary DNS Server	0 0 0	1
Delaut Galeway	0 . D . O . O	Domain Name		_
Get IP address fro	m the BOOTP server			
sestat (power res	ing is valid only far next unit dosation) P setting will be cleared.	IP Router Table		
The obtained IP	address will be automatically setting in the unit.	IP Address	Galaway Address	Date
Broadcast				Date
@ All1 (4.38SD)				
C AI0(4285D)				
				_
I rog a fail have	Transfer(PC to Unit) Com	own 1		estat
		page 1		- 10 C

Figure 4.35: Ethernet module for CJ2MCPU3* PLC

- 21.Fill in the IP address and subnet mask as per screenshot. And transfer the data (PC to unit).
- 22.Connect the Ethernet cable to NQ-Series and PLC and connection is ready.
- 23.For verification of correct data you can Click Windows in View menu and select Watch
- 24.Enter here H0 and view if data is the same as on screen of NQ-Series, changing the Data on NQ-Series screen should affect the data of H0 in PLC.
- **Note** The following messages are displayed on the NQ-Series screen if problems occur:
 - !!!! no connection ,
 - ??? connection established, address unknown

4-6-1-2 NQ-Series with OMRON FINS over Ethernet to Trajexia

To perform a successful communication to Trajexia TJ* modules proceed as follows:

- 1. Create a new project in NQ-Designer.
- 2. Select the correct model to be used.
- 3. Go to Ethernet tab and make there the proper settings for the Ethernet data for NQ-Series. Defaults displayed are factory settings of NQ-Series

Post settings					
P DHOP					
IP Address	192 . 168	. 250 . 100	Subnet Mask	255 . 255 .	255.0
Download Port	5000	<u>-</u> (1024-6553	5) Default Galeway	0 . 0 .	0 . 0

Figure 4.36: Project Configuration, Ethernet tab

- 4. Press OK.
- 5. A project is created.
Connecting NQ-Series to OMRON products

6. Go to the nodes folder in the tree and ADD a node. Following screen will show.

ode Information Katho	Node 1		Max15	Address		5	(1 to 32)	0
eterhane Delay	-	1010.00	character (00)ms	Response T	and Dec	[680	(10 % 50	ilm -
ana ana amin'ny faritr'i Anala. Ana amin'ny faritr'o amin'ny faritr'o amin'ny faritr'o amin'ny faritr'o amin'ny faritr'o amin'ny faritr'o amin'	P0			(resignment)				
Reny Cours	P.	18105	12			PLCSon Rel	107132	
elect Protocol								
Port	Ethornet		Piot	ocul FIN	S aver UD	P/IP	_	٠
			Med	iel Traj	tvia			٠
TINS Source Ad	deis	FINS Destin	elian Addres	19				
Network 0	크	Notwark.	0 4	0	estivation	C.,		
Node [13	Node	0 =		Address	192.168.2	50.15	
NUTCHER OF STREET			1000					
Unk Address		Unit Addres	• (#					
						Add C	kot	Apply

Figure 4.37: Node information

- 7. Fill in the Trajexia name, if required
- 8. Port, select ETHERNET
- 9. Protocol, select FINS over UDP/IP
- 10.Model, select Trajexia
- 11. Destination, fill in here the IP address of your Trajexia you want to communicate with.
- 12.Click ADD
- 13. You have now made the settings for the NQ-Series (IP 192.168.250.100) to communicate with Trajexia (IP 192.168.250.15) using FINS.
- 14.Go to the taglist and create a Trajexia tag (VR1000 as an example)
- 15.Goto screen 1, add a numerical input and assign it to VR1000
- 16.Download the application AND firmware to the NQ-Series using serial, USB or ethernet connection.

Mode USB Serial Ethernet	CANAGE STREET	5006 코 레 코 (20-685	IP Address 192 . 160 . 25	0 . 100
		en "T) fen inn	no seci	
	Diplions -			
	P Acolicatio	n	F Fort	
	Finance		Ethernel Sellings	
	F institu	71	T Hatarra Data :	
	C Date this	dialog box when dow	feed completes	
	Options (C Dow	neat 1 alloc	Close He	e î

Figure 4.38: Communication, Ethernet

Note: If you have changed the Ethernet settings in Project configuration, you also need to download the Ethernet settings in the download windows.

Downloading the data using the Ethernet connection be aware the IP and port number in the Download window are exactly the same as IP and port number of the NQ-Series. (Power on the NQ-Series and on startup the current IP address of the NQ-Series will be displayed)

- 17.Open CX-Motion Pro and connect to the Trajexia.
- 18. Right click on device
- 19.Add the connected Trajexia
- 20.Doubleclick on the Trajexia icon

Solution Explorer 🛛 🕸 🛪	Configuration [Device1]	* () X
E TIL Devices	Carfiguration Status Cammunications General Date Time Memory Manager Configuration Ethernet Configuration Modius TCP Device / Simulation @ Use Device Simulate Device Response / Request Max Attempts: 2 Timeout: [0000 mil Ethernet IP Address: [192.040.250.15	

Figure 4.39: CX-Motion Pro, Configuration

21.Enter here the IP address for the Trajexia

22.Go online with Trajexia pressing 🛛 ዿ

- 23.Select monitor
- **Note** The following messages are displayed on the NQ-Series screen if problems occur:
 - !!!! no connection,
 - ??? connection established, address unknown

4-6-2 Using serial connection

For serial communication NQ-Series have serial ports (com1 and com2 (NQ5)). Using this port serial data can be exchanged via RS232 (com1 and com2) or RS422/RS485 (com1). Following examples describe how to set a working communication between NQ-Series and an Omron device.

4-6-2-1 NQ-Series with OMRON Host Link Driver to OMRON CP1L PLC

To perform a successful communication proceed as follows.

- 1. Create a new project in NQ-Designer.
- 2. Add a Hostlink Node and settings as below and click Add...

Protocol : [One	an Host Link 💌	Model :	CP1L	•	
Communication 5	iettings				
Boud Rate :	¥00 •	Diata Bite :	7	*	
Party:	Even 💌	Step Bits :	2	*	
					Add Node
odluct Information Product : NQ Model Dataile				and a second	
	320 x 240			inage	
Display Size :	35"				
Color Supported :	256				
Function Keys :	5				
	1 Serial Port, USB				
Pon:	Yes				
Pans: COM1 :	1.88				
	No				

Figure 4.40: Project Configuration

- 3. Set all data as shown in the screenshot.
- 4. Create PLC tag with address DM0000.
- 5. Add a Numerical Data Entry object with tag address DM0000 to screen1.
- 6. Download the application and firmware to the NQ-Series.
- 7. Open CX-Programmer.
- 8. Create a new project.
- 9. Select CP1L and click OK.
- 10.Double-click Settings in the project panel.
- 11. Click Serial Port 1 tab.

Section 4-6

Start Code Chaotie Set 0x0000 = C DR LF C DR LF C Set Ent Code 0x000 = C Master	hup Settings Timings Inc Communications Settings Standard (9600 : 1.7.2.E) Custom Baud 9000 •	Format	Mode	IDidek	eda
	Positie Ser Diccool - Response Timeout Unit P - "100 ms	Received Byte DR LF Det Detay	[3-0000 - E		PC Link: Unit No

Figure 4.41: PLC Settings - New PLC

12.Set all data as shown in the screenshot.

13. Download the application into the PLC.

14.Click Windows in View menu and select Watch.

15.Enter **D0** in the first line in the **Watch** window.

IC Nome Name rxPLC1	Address D0	Data Type / Formak UDVT (Decimal, Channel)	FB105age	Yaba	Value(B	Convient
	-	Constant of the other states of the second second	CONTRACTOR OF STREET, ST			

Figure 4.42: Watch window

16.Change Channel type to unit.

- 17.Connect the cable to the NQ-Series and PLC. Ensure the label on the cable corresponds with the NQ-Series and PLC (cable connectors are both male). Refer to A-1-2 NQ-Series to PLC (NQCN222 / NQCN521).
- 18.Check the blue LED. If the blue LED is steady on, a correct connection has been established.
- 19.Enter **345** on the NQ-Series screen. If the connection has been correctly established the same value is shown in the **Watch** window of CX-Programmer.
- **Note** The following messages are displayed on the NQ-Series' screen if problems occur:
 - !!! no connection
 - ??? connection established, address unknown

4-6-2-2 NQ-Series with OMRON NT Link to OMRON CP1L PLC

To perform a successful communication proceed as follows.

- 1. Create a new project in NQ-Designer.
- 2. Add a NTlink Node and settings as below and click Add...

Select Protocol					
Protocol : 0mea	n NT Link 💌	Model	CP1L	-	l)
Communication Se	ning				
	15.2K	Data Bita	0		
Party 0	idi 💌	Sice Bits :	1	-	
					Add Node
Product : NQ3 Model Details Resolution :	320 x 240			Inage	
Display Size : Color Supported :					
Function Keys :					
	1 Serial Post, USB			*	
COM1 :	Yes				
COM2:	No				
ovine.	Na				
Ethernet:					

Figure 4.43: Project Configuration

- 3. Set all data as shown in the screenshot.
- 4. Create PLC tag with address DM0000.
- 5. Add a Numerical Data Entry object with tag address DM0000 to screen1.
- 6. Download the application and firmware to the NQ-Series.
- 7. Open CX-Programmer.
- 8. Create a new project.
- 9. Select CP1L and click OK.
- 10.Double-click Settings in the project panel.

11. Click Serial Port 1 tab.

Stat Code
Descous Tenned Halthanker Date: NT/DC1 of Max. DC1 of 11
1 2 100 me 1 2 10 me 1 2 10 me

Figure 4.44: PLC Settings

12.Set all data as shown in the screenshot.

13. Download the application into the PLC.

14.Click Windows in View menu and select Watch.

15.Enter **D0** in the first line in the **Watch** window.

PLC Nome Name AnxiPLC1	Address D0	Data Type / Formak UINT (Decimal, Channel)	FB10sage	Yalua	Value(B	Convent	
	-						
a sheet	(sheet2)	sheet3/		-			4

Figure 4.45: Watch window

16.Change Datatype to Uint

- 17.Connect the cable to the NQ-Series and PLC. Ensure the label on the cable corresponds with the NQ-Series and PLC (cable connectors are both male). Refer to A-1-2 NQ-Series to PLC (NQCN222 / NQCN521).
- 18.Check the blue LED. If the blue LED is steady on, a correct connection has been established.
- 19.Enter **89** in the NQ-Series' screen. If the connection has been correctly established the same value is shown in the **Watch** window of CX-Programmer.
- **Note** The following messages are displayed on the NQ-Series' screen if problems occur:
 - !!! no connection
 - ??? connection established, address unknown

4-6-2-3 NQ-Series to OMRON Memobus inverter

To perform a successful communication between NQ-Series combined with OMRON Memobus inverter proceed as follows. The example shown is applicable for V1000. The addresses and parameter settings can vary depending on the choice of the Memobus inverter (not V1000).

- 1. Create a new project in NQ-Designer.
- 2. Right-click the Nodes folder and click Add...

Protocol : 0mm	an Inverter Memokus 💆	Model	Inveters	•
Communication S				
	M00 ·	Data Bits :	8	
Party:	Even 💌	Stop Bits :	1	•
				Add Ned
aduct Internation				
Product: NQ	3100008			
Model Details	701 - 740		The second second	nage
Display Size :				
Color Supported:				
Function Keys :				-
Parts :	1 Serial Port, USB			
COM1 :	Yes			
	No			
COM2:				

Figure 4.46: Project configuration

- 3. Set all data as shown in the screenshot.
- 4. Press OK
- 5. Go to nodes folder
- 6. Click on Modbus RTU node
- 7. Click on PLC specific settings
- 8. Make sure that the defined "default" communication register is an existing register in your Modbus slave or the communication will NOT be initiated (see note).
- 9. Create a tag with address HR401061
- 10.Add a display data numeric object with tag address HR401061 on screen1
- 11. Download the application and firmware to the NQ-Series.
- 12.Press down button on the inverter until PAr is shown on the inverter's display.
- 13.Press enter.
- 14.Set the following parameters:
 - B1-01=2
 - H5-01 = 1 (node 1)

Connecting NQ-Series to OMRON products

- H5-02 = 3 (9600 bps)
 - H5-03 = 1 (even parity)
- Stop bit and Data Length are fixed as 1 and 8 respectively (refer to manual).
- H5-07 = 1 (RS-422 connection).
- 15.Switch off the inverter.
- 16.Create a cable. Refer to A-1-4 NQ-Series to inverter (V1000, RS-422 connection).
- 17.Connect the cable to the NQ-Series and inverter.
- 18.Switch on the inverter.
- 19.If the connection has been correctly established the node number shown on the NQ-Series.
- **Note** H5-07 = 0 (RS-485 connection): Create the applicable cable. Refer to (V1000 RS-485 connection) A-1-5.
 - NQ-Series establishes a connection to the inverter by exchanging a default address HR400001. If this address is not available in the used inverter, the connection will not be established. To establish the connection proceed as follows.
 - 1 Click in the **Nodes** folder and right-click the Node1 inverter.
 - 2 Click Edit.
 - 3 Click PLC Specific Setting.

Type Holding registers *	🗖 Repedeant Nate
Addens 1 3 (1 to 82576)	Broadcast enable bit
Note: This register is used to test communication with the device to see if the	a 🚺 100-991
device is contected and to check if retirings are proper.	Mothus Register Start Address
	Tape Calk +
Modbus Command Force Modbus command 15 and 16 for single point wates	Addiena (1 to 65535)
This is used in case where Slave does not support single point write functions (6) and (b)	PZH Register Start Address
4 Bytes Famiat	D \$0 100840 999 1
F High Word - Law Ward	A CONTRACTOR OF A CONTRACTOR OFTA CONTRACTOR O
C Low Ward - High Word	Ro al Regatera
2 Bytes Famal	C From Leg. D 0 (00006 9991)
F High Byte - Love Byte	The mental set and the set of the
C Low Byte - High Byte	

Figure 4.47: PLC Specific Setting

- 5 Change **Default communication register** address to an available address in the inverter.
- 6 Click OK.
- 7 Download the application to the NQ-Series.
- The following messages are displayed on the NQ-Series' screen if problems occur:
 - !!! no connection
 - ??? connection established, address unknown

4-6-2-4 NQ-Series to CelciuX° (EJ1N) Temperature Controller (ModBus RTU)

To perform a successful communication proceed as follows. The example shown is applicable for EJ1.

- 1. Create a new project in NQ-Designer.
- 2. Right-click the **Nodes** folder and click **Add...**

Select Protocol					
Phakosal Modi	aus Fittu Unit as M. 💌	Model :	16 events		-
Communication S	ettings				
second to the second second	eco 💌	D-ata Bito :	0		*
Party:	ven 💌	Ship Bits :	1		•
					Bidd Node
aduct Information					
hoduct: NQ3	FTQ000-B				
Model Details				- Inege	
Resolution :	320 × 240				
Display Size :	3.5"				
Color Supported :	256				
Function Keys :	5				
Ports :	1 Serial Port, USB				
COM1 :	Modbus RTU (Unit as	Maoter)			
COM2:	No				
Ethernet :	No				

Figure 4.48: Project configuration

- 3. Set all data as shown in the screenshot.
- 4. Press OK
- 5. Go to nodes folder
- 6. Click on Modbus RTU node
- 7. Click on PLC specific settings
- 8. Make sure that the defined "default" communication register is an existing register in your Modbus slave or the communication will NOT be initiated.
- 9. Create a tag with address Holding register 513. (400513).
- 10.Add a Numerical Data Entry object with tag address 400513 on screen1
- 11. Download the application and firmware to the NQ-Series.
- 12.Set Unit number to 1 on EJ1(rotary switch).
- 13.Set the following dipswitches on TC module:
 - SW2 dipswitch 3 to ON
 - SW2 dipswitch 4 to OFF
 - SW2 dipswitch 5 to OFF
- 14.Switch on the EJ1 temperature controller.
- Create a cable. Refer to A-1-6 NQ-Series to CelciuX° (EJ1N) temperature controllers (RS-485 connection).
- 16.Connect the cable to the NQ-Series and EJ1C-EDUA-NFLK

- 17.Displayed on your screen will be now the "Channel 1 Process Value)
- 18.Correct data can be monitored by connecting CX-Thermo to your EJ1.
- **Note** The following messages are displayed on the NQ-Series' screen if problems occur:
 - !!! no connection
 - ??? connection established, address unknown

SECTION 5 Transferring programs

This section describes how to transfer NQ-Designer programs to NQ-Series models.

5-1	Downloading72
	Uploading
5-3	USB host functionality

5-1 Downloading

A project can be downloaded from NQ-Designer to the NQ-Series. A project always consists at least of an Application and Firmware.

5-1-1 Downloading options

The following options can be selected:

- Application
- Firmware
- Font
- Ethernet settings

5-1-1-1 Application option

If this option is selected, only the application will be downloaded to the NQ-Series.

5-1-1-2 Firmware option

If this option is selected the firmware will be downloaded to the NQ-Series. This option is necessary if:

- The firmware is downloaded to the NQ-Series for the first time.
 - A PLC is either added or deleted in the network configuration.
- The firmware is updated with a newer version.
- Applications that are created in an older NQ-Designer version are downloaded to the NQ-Series.
- Changes made in Datalogger configuration.

5-1-1-3 Font option

If this option is selected the fonts will be downloaded to the NQ-Series. This option is necessary if the default fonts have been modified.

5-1-1-4 Ethernet settings option

If this option is selected the ethernet settings of the NQ-Series defined in Project configuration, Ethernet will be send to the NQ-Series. This should always be downloaded into the NQ-Series when any modification is made in this screen.

5-1-2 Downloading applications

To download an application proceed as follows.

1 Click **Download** (🔙).

Mode USB Sevial Ethnorvat	Post Number 5000 2 IP Address 192 . 168 . 250 . 100 Response Timecul 20 2 (20 - 65535 Sec)	
	Options IP Fort IP Application IP Fort IP Fermane IP Ethernet Settings IP Logged Data IP internated Assess Data	
	Obse this dialog box when download completes Ots Options <c download="" help<="" obse="" room="" td=""><td></td></c>	
eady.		

Figure 5.1: Download window

- 2 Select the required options and settings.(USB, application (project), FW, Font).
- 3 Click Download.

When selecting Ethernet make sure that the port number and IP address match the settings currently stored in the NQ-Series. Shown in the download window are the default settings stored in the NQ-Series.

The download screen shows a progression bar. When the download is finished a message "Download completed" will be shown on screen.

Note

Removing the communication cable during a download will result in a loss of data in the NQ-Series. All (firmware and application) needs to be downloaded again).

5-1-3 Download errors

The following errors can occur during downloading applications:

- Product mismatch
- · NQ-Series is not responding
- · Port is either busy or does not exist

A product mismatch error occurs if an application is not compatible with the NQ-Series attached.

If the NQ-Series is not responding this indicates that no communication has been established between the PC and the NQ-Series. Please check the following:

- The NQ-Series is connected to the PC.
- The NQ-Series is connected to the selected port (serial or USB).
- The port is working properly.
- The NQ-Series is not powered down.

5-2 Uploading

An existing application can be uploaded from the NQ-Series to NQ-Designer. During the upload process the communication to the PLC is disconnected. After the Upload has finished the NQ-Series will restart.

5-2-1 Uploading options

The following options can be selected:

- Application
- Logged Data
- Historical alarm data

5-2-1-1 Application option

If this option is selected, only the application will be uploaded from the NQ-Series to NQ-Designer.

Tag names and screen names are only uploaded if **Downloading Tag names** is selected on the **Settings** tab on the **Project Configuration** dialog. If this option is not selected the tag names and screen names are uploaded with default names.

Screen Sc	etings aver Enable [600 (1-5400)	IF Erace	ng Download Data Logger Memory Historical Alarm Data Noad Tag names	
Model Details Resolution : Display Size :	3700008 320 x240 357		Image	-
Color Supported Function Keys :				100
Porta :	1 Serial Port, USB			
COM1 :	Ottean NT Link (1.N)			
	No			

Figure 5.2: Project configuration

5-2-1-2 Logged Data option

If this option is selected, only the logged data will be uploaded from the NQ-Series. The logged data is displayed in CSV format.

To display the logged data click **Display Logged Data...** on the **Tools** menu.

5-2-1-3 Historical alarm data option

If this option is selected, only the Historical alarm data will be uploaded from the NQ-Series. The logged data is displayed in CSV format.

To display the historical alarm data click **Display Historical alarm Data...** on the **Tools** menu.

5-2-2 Uploading programs

To upload a program from the NQ-Series proceed as follows.

1 Click Upload (🔄).

Communicat	lon	×
Mode USB Sevial Ethernet	Port Number 5000 ## IP Address 192 168 250 100 Response Timeout 40 ## (20 - 65535 Sec) <td></td>	
	Options	
	F Logged Data	
	Г ОХ	
	Dptions ({ Upton# Ator: Close Help	
Ready		

Figure 5.3: Upload communication

- 2 Select the required options and settings.
- 3 Click Upload.

When selecting Ethernet make sure that the port number and IP address match the settings currently stored in the NQ-Series. Shown in the download window are the default settings stored in the NQ-Series.

5-2-3 Uploading errors

The following errors can occur during uploading programs:

- NQ-Series is not responding
- Port is either busy or does not exist

If the NQ-Series is not responding this indicates that no communication has been established between the PC and the NQ-Series. Please check the following:

- The NQ-Series is connected to the PC.
- The NQ-Series is connected to the selected port (serial or USB).
- The port is working properly.
- The NQ-Series is not powered down.

5-3 USB host functionality

The USB host port can be used to perform a download or an upload of an application to or from an USB stick. This enables the user to update the NQ-Series or download logging data without the use of a Personal computer.

The NQ-Series only supports USB sticks that are formatted FAT or FAT32.

Note

Make sure to backup all data on the USB stick before connecting it with the NQ-Series.

To establish a connection between the USB stick and the NQ-Series proceed as follows:

- 1 Place the USB stick in the USB host port.
- 2 An *empty* NQ-Series (no application or no firmware) will automatically start the USB Host function when the NQ-Series detects an USB stick.
- 3 When running an application setting system bit s037 to 1 will start USB host function provided the USB stick is connected.



Figure 5.4: USB host functionality confirmation

5 Click **YES** to continue.



Figure 5.5: Enumerating memory stick

6 Click **Download** or **Upload**.



Figure 5.6: Confirm operation

5-3-1 Downloading from USB stick to NQ-Series

In order to correctly download an application from the USB stick to the NQ-Series the following files must be present in the project folder (NQxxQxxx, e.g. NQ3TQ000 for NQ3-TQ000B HMI.

- Application file (NQx-xQxxx-B_APP.NQP)
- Firmware file (NQx-xQxxx-B_FW.ABS)
- Font file (NQ_FONT_File.BIN)

This folder and contents can be found in the saved project location on your Personal Computer.

The following data can be downloaded to the NQ-Series.

- Application
- Firmware
- Fonts
- 1 Connect the USB stick to the NQ-Series.
- 2 Click Download.



APPLICATION	FIRMWARE
FDN	TS
	EXIT
Figure 5.7: Do	wnload options

3 Click **APPLICATION** to erase the old application and download the new application from the USB stick to the NQ-Series.

Download operation Application in un	on will overwrite
This may take se	
TITAD THUS CURE SE	
	Back

Figure 5.8: Confirm operation

USB host functionality

4 The following message is displayed after downloading.



Figure 5.9: Download completed

Click **OK** to finish.

Now you can repeat step 3 and 4 for firmware and fonts.

5-3-2 Uploading from NQ-Series to USB stick

In NQ-Designer it is possible to upload the datalogger and Historical alarm data to an USB stick.

Two different methods can be used:

- Running on background of application (*.CSV output)
- Invoke application to upload the files (*.BIN output, NQ-Designer required)

Uploading your log files to USB stick on the background NQ-Designer provides you with 2 options in your program.

Option 1: Trigger and monitor the upload process from PLC / NQ-Series In TASK, Global task section you find commands "Upload All logged data to USB stick" and "Upload Historical Alarm data to USB Stick". Defining here the control bit and status word you can set and monitor the actual upload of the log files. The status register will also contain the error code if a download is not working correctly.

Option 2: Button task function.

The advanced button contains tasks "USB Data Log Upload and USB Historical Alarm Upload" The control bit here is the button , the status register selected can only be a NQ-Series register.

For uploading application or firmware a running program must be invoked.

Additional method provided can also upload the datalogger and Historical Alarm data.

Access to below described function is only possible if system bit s0037 is set to high and USB stick is connected.

The following data can be uploaded from the NQ-Series to the USB Stick

- Application
- Firmware
- Application + logged data
- Application + Historical alarm data
- Fonts
- 1 Connect the USB stick to the NQ-Series.
- 2 Click Upload.

Do you want to Do	wnload or Upload?
Download -> Memor	y stick to Unit
Upload -> Unit	to Memory stick
Designed	Linksed
Download	Upload

Figure 5.10: Confirm operation

3 Click APPLICATION to upload the new application from the NQ-Series to the USB stick.

Upload Options



Figure 5.11: Upload option

4 The following message is displayed after uploading.

Messa9e	
Upload completed successfully	y i
Ok	

Figure 5.12: Upload completed

Click **OK** to finish.

Repeat step 3 and 4 if you need to upload any of the other options also need to be uploaded to the USB stick.

SECTION 6 Simulation and debugging

This section describes how to simulate NQ-Series programs and debug programs.

6-1	Simulation	82
6-2	Debugging	82

6-1 Simulation

Click () to start simulation.

With the simulation function you can simulate your project on your Personal Computer.



Figure 6.1: Simulation

Not supported in simulation is:

- PLC communication (PLC tags are not handled and remain 0)
- Set RTC (RTC viewing is supported, PC clock is displayed)
- Data logging
- Historical Trends
- Historical alarms

6-2 Debugging

For debugging your NQ-Series you can use an internal program inside the NQ-Series.

The debugging program (**FWHT**) allows you to test all HW sections within your NQ-Series.

To start **FWHT**, please look at 7-4-1 FHWT.

SECTION 7 Maintenance

This section describes the maintenance and factory application of the NQ-Series.

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7-2	Touch screen calibration	85
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7-4	NQ-Series diagnostics	87

7-1 Erasing keys

If necessary, It is possible to erase an application or firmware in the NQ-Series. The corners of the touch screen are used for erasing.



Figure 7.1: Erasing keys

- 1 Erase firmware
- 2 Erase application
- 3 Confirm
- 4 Starting FWHT and system set-up

To erase an application proceed as follows.

- Press the top right corner of the touch screen for 2 seconds during poweron.
- The following message is displayed: **Application Erase Mode... Press at Bottom Right corner to confirm**. Press the bottom right button to confirm.
- After erasing the program the following message is displayed: **No setup loaded. Download application.**

To erase the firmware proceed as follows.

- Press the top left corner of the touch screen for 2 seconds during poweron.
- The following message is displayed: Firmware Erase Mode... Press at Bottom Right corner to confirm. Press the bottom right button to confirm.
- After erasing the firmware the following message is displayed: No firmware.... Download firmware.

If the NQ-Series does not function correctly, erase the application and download a demo program. If the NQ-Series functions correctly, it is possible the previous application was incorrect.

7-2 Touch screen calibration

The touch screen is already calibrated. The calibration data is stored in the flash memory of the NQ-Series. Touch screen calibration is necessary if the user encounters the following problems:

- Any press inside a defined object boundary does not result in the expected action.
- An undefined area performs a task of some other defined object.

To calibrate the touch screen proceed as follows. For accurate calibration use a stylus or wooden pencil.

- Press the centre of the touch screen for more than 2 seconds during power-up.
- A cross is displayed at the bottom in the left corner. This cross remains on the touch screen for approximately 4 seconds. If the centre of the cross is not pressed at this moment, the NQ-Series resumes to normal operation. Touch the centre of the cross with a pointed object (stylus).

Keep pressing until the NQ-Series reports valid point.

• The next screen is displayed with a cross at the top right corner of the touch screen. This cross remains on the touch screen for approximately 4 seconds. If the centre of the cross is not pressed at this moment, the NQ-Series resumes to normal operation. Touch the centre of the cross with a pointed object (stylus).

Keep pressing until the NQ-Series reports valid point.

• A successfull calibration always results in a message **Calibration completed....restarting!!!** on screen.

7-3 Troubleshooting

Problems and errors are shown in two ways:

- With blue Run LED
- With self-diagnostic messages

7-3-1 Run LED

The Run LED on the touch screen is used to show the status, problems, and/ or errors in the NQ-Series.

If the Run LED is on, the NQ-Series is functioning correctly and an application is downloaded into the NQ-Series. If the Run LED is off and stays off, even after touching the screen, the power to the NQ-Series is not correct. Check the cable connections and/or power supply.

LED	Backlight	Action	Status/Solution
OFF	OFF	Press the touch screen. The backlight does not come on.	Failure in the power supply. Check the power supply and connections.
OFF	ON	Check the LED bit 36. The LED bit s36 is turned off.	The LED status bit s36 is turned off. Turn the LED status bit s36 on.
ON	OFF	Press the touch screen. The backlight comes on.	The NQ-Series is in screen saver mode.
ON	ON	-	The NQ-Series is in normal operation
ON (flashing slow)	ON	-	The NQ-Series is working correctly and is downloading or uploading.
ON (flashing fast)	ON	-	The NQ-Series is in normal operation but can not establish communication with one or more 'PLC' nodes

Table 7.1: Run LED status

7-4 NQ-Series diagnostics

The NQ-Series' firmware contains a special application to test the NQ-Series' functions and to set the NQ-Series.

The following tools can be used for standalone NQ-Series diagnostic.



Figure 7.2: Loopback connector RS-232/RS-485/RS-422 for testing the serial ports

To access the special application proceed as follows.

- 1 Download a firmware and an application in the the NQ-Series. (This can be an empty project.)
- 2 Press (5 seconds) lower left corner of touch screen during power up of the NQ-Series. Wait for approximately 5 seconds until the following screen is displayed.



Figure 7.3: Mode selection menu

- 3 Choose the application **FHWT** or **System Setup**.
- 4 Press **Exit** to exit the factory application.

7-4-1 FHWT

The FHWT (Hardware Test) mode is used to test the HW of the NQ-Series. Examples are LCD test, Function key test, Communication port test, etc.

RAM EEPROM RTC	LCD	Touch Scree	n Flash
	SRAM	EEPROM	RTC

Figure 7.4: FHWT page 1

	FHWT MODE	
RS 232 Com1	RS 485 Com1	USB
RS 232 Com2	Expansion Port	Buzzer
	Ethernet Port	
Save Result	Erase Result	Display Result
Prev	Send Result To PLC	Exit

Figure 7.5: FHWT page 2

T	Disc totte
Test	Description
LCD	To test the LCD.
Touch Screen	To test the touch screen.
Flash	To test the flash.
SRAM	To test the SRAM.
EEPROM	To test the EEPROM.
RTC	To test the function of RTC.
Function keys	To test Function keys.
Brightness	To test the brightness of the screen.
Contrast	To test the contrast of the screen (NQ5)
RS-232 Com1	To test the RS-232 on Com1.
RS-485 Com1	To test the RS-485 on Com1.
RS-232 Com2	To test the RS-232 on Com2 (NQ5).
USB	To test the USB ports.
Expansion Port	Reserved.
Buzzer	To test the beeper.
Ethernet connection	To test Ethernet cable connection
Save Result	Reserved.
Display Result	Reserved.
Send Result to PLC	Reserved.

Table	7 2.	FHWT	mode	tests
TUDIC	1.4.		mouc	10010

Pressing the above buttons on screen will start specific tests as indicated on the buttons. If needed follow the instruction shown on screen.

7-4-2 System set-up

System set-up menu can be used to set the NQ-Series. In this special application you can quickly set the RTC time, communcation ports, clear the retentive registers, etc.

SYSTEM SETUP MENU		
TouchScreen Calibrate	Brightness Control	
RTC Settings	Com Port Settings	
Ethernet Settings	ScreenSaver Time	
Exit	Next	

Figure 7.6: System set-up menu page 1

Application Erase	Firmware Erase
Retentive Erase	Battery Status
Beeper Setting	System Information

Figure 7.7: System set-up menu page 2

Setting	Description
TouchScreen Calibrate	To calibrate the touch screen. Refer also to 7-2 Touch screen calibration.
Brightness Control	To set the brightness of the screen.
Contrast Control	To set the constrast of the screen (NQ5)
RTC Settings	To set the RTC.
Com Port Settings	To set the com port.
Ethernet Settings	To set the Ethernet parameters for the NQ.
ScreenSaver Time	To set the screensaver time.
Application Erase	To erase the application. Note that if you perform this action you can not continue with NQ-Series diagnos- tics.
Firmware Erase	To erase the firmware. Note that if you perform this action you can not continue with NQ-Series diagnos- tics.
Beeper Setting	To set the beeper.
Battery Status	To view the battery status.
Clear retentive registers	To clear all retentive registers.
System Information	To view the system information.

Pressing the buttons on one of the 2 set-up screens will take you to the specific set-up procedures for the specific settings.

A Appendix A

A-1 OMRON communication cables

A-1-1 Cable references

The following tables provide an overview of the available cables from OMRON. The table shows which PLC can be used with the cable. OMRON provides three types of cables:

- Cables for PLCs with serial ports (DSUB9 to DSUB9)
- · Cables for PLCs for mini-peripheral ports (DSUB9 to mini-peripheral)
- Programming cables

Table A.1: DSUB9 to DSUB9

PLC	Cable	Note
CP1*	NQ-CN222	2 meter cable
CJ*	NQ-CN521	5 meter cable
CS1		
CPM2*		
CQM1H		

Table A.2: Mini-peripheral to DSUB9

PLC	Cable	Note
CJ1	NQ-CN221	2 meter cable
CS1		
CPM2C		
CQM1H		

Table A.3: Programming cables

Cable	Note
CP1WCN221	USB cable (1.8 meter)
NT2SCN002	Serial cable (2 meter)

NQ-Series to PLC (NQCN222 / NQCN521) A-1-2





DB9 MALE PINOUTS (NQ)

DB9 MALE P	INOUTS (PLC)	DB9 MALE PI	NOUTS (NQ)
Signals	Pin number	Pin number	Signals
	1	 1	
TXD	2	2	TXD
RXD	3	3	RXD
RTS	4	4	
CTS	5	5	SG
	6	6	
	7	7	
	8	8	
SG	9	9	
Shield	wire to DB9 body	Shield wire to	o DB9 body

Cable configurations may be set to 2 configurations per page to reduce excess white area

A-1-3 NQ-Series to PC



DB9 FEMALE PINOUTS (PC)

Signals	Pin number	
	1	
RXD	2	
TXD	3	
	4	
SG	5	
	6	
	7	
	8	
	9	
Shield wire to DB9 body		



DB9 MALE PINOUTS (NQ)

Pin number	Signals		
1			
2	TXD		
. 3	RXD		
4			
. 5	SG		
6			
7			
8			
9			
Shield wire to DB9 body			

A-1-4 NQ-Series to inverter (V1000, RS-422 connection)



FREE END		DB9 MALE PINOUTS (NQ)	
Signals] [Pin number	Signals
(R+) RX+		1	TX+
(R-) RX-	- 	2	
S+ (TX+)		3	
S- (TX-)		4	RX+
IG		5	SG
	- <u> </u>	6	
		7	
		8	TX-
		9	RX-
shield wire to ground		- shield wire to body	
A-1-5 NQ-Series to inverter (V1000, RS-485 connection)





A-1-6 NQ-Series to CelciuX° (EJ1N) temperature controllers (RS-485 connection)



A-2 Non-Omron devices to NQ-Series configurations

A-2-1 NQ-Series as Modbus RTU Master and ModSim (Slave-Simulation Software)

There are two options available in Modbus RTU: Modbus, 1 word length commands and Modbus, 16 word length commands. If Modbus driver is selected, all registers should be available in the slave.

In the following example ModSim (Modbus Slave Simulator www.wintech.com) is used to the check whether the Modbus RTU master is communicating properly. The settings of the Modbus slave unit used should be set according to settings of ModSim to ensure a good communication.

To perform a successful communication proceed as follows.

- 1 Create a new project in NQ-Designer.
- 2 Right-click the **Nodes** folder and click **Add...**.

Select Photocol 1					
Protocol : Moda	us RTU Unit as M. 💌	Model :	16 awards		-
Communication St	effings				
a state of the sta	• 003	Data Bits :	1		-
Parity: E	iven 💌	Step Bits :	1	3	•
oduct Information					AddNote
Poduct: NQ3	50000F				
Model Detaile				Image	
Resolution:	320 x 240				
Display Size :	35"				
Color Supported :	256				i
Function Keys :	5				
Poita :	1 Serial Port, USB				
COM1 :	Mothus RTU (Unit a	(Madter)			
00M2:0	No				
Ethernet :	No				

Figure A.1: Project configuration

- 3 Set all data as shown in the screenshot.
- 4 Press OK
- 5 Go to nodes folder
- 6 Click on Modbus RTU node
- 7 Click on PLC specific settings
- 8 Make sure that the defined "default" communication register is an existing register in your Modbus slave or the communication will NOT be initiated.
- 9 Create PLC tag with address HR400100.
- 10 Add a Data Entry object with tag address HR400100 on screen1.
- 11 Download the application and firmware to NQ-Series.
- 12 Open ModSim.
- 13 Click New on File menu.

ModSim1						
Address: 0100 Length: 100	Device Id: MODBUS P 03: HOLDING R					
*** NOT CONNEC	TED! ***		1			_
40100: (00000) 40101: (00000) 40102: (00000) 40103: (00000) 40105: (00000) 40105: (00000) 40105: (00000) 40106: (00000) 40109: (00000) 40109: (00000) 40110: (00000) 40111: (00000) 40113: (00000) 40114: (00000)	40116: <00000) 40117: <00000) 40118: <00000) 40120: <00000) 40122: <00000) 40122: <00000) 40122: <00000) 40122: <00000) 40122: <00000) 40125: <00000) 40125: <00000) 40126: <00000) 40128: <00000) 40129: <00000) 40130: <00000)	40132: (00000) 40133: (00000) 40135: (00000) 40135: (00000) 40135: (00000) 40137: (00000) 40130: (00000) 40132: (00000) 40140: (00000) 40142: (00000) 40143: (00000) 40145: (00000) 40145: (00000) 40145: (00000)	40148: <00000) 40149: (0000) 40150: (00000) 40151: <00000) 40152: <00000) 40153: (00000) 40153: (00000) 40155: (00000) 40155: <00000) 40156: <00000) 40158: <00000) 40159: <00000) 40161: <00000) 40161: <00000) 40161: <00000)	40164: (00000) 40165: (00000) 40165: (00000) 40168: (00000) 40169: (00000) 40170: (00000) 40171: (00000) 40172: (00000) 40174: (00000) 40175: (00000) 40177: (00000) 40177: (00000) 40177: (00000)	40180: (08000) 40181: (08000) 40182: (08000) 40183: (08000) 40184: (08000) 40185: (08000) 40186: (08000) 40187: (08000) 40188: (08000) 40190: (08000) 40190: (08000) 40191: (08000) 40191: (08000) 40191: (08000) 40192: (08000) 40193: (08000) 40194: (08000)	

Figure A.2: ModSim32 - ModSim1

- 14 Set all data as shown in the screenshot.
- 15 Click **Connect** on **Connection** menu.

Accession of the second	C Dariel/ENRDN pickocol
Baud Role:	5600 .
D-ata Bits	
Stop Bits	1 .
Party	EVEN .
Hardware Flow Control	
Wall for DTR from	n Master
	eatter RTS before manifiling first character
Wait for CTS from	Master
	s after last character elore releasing PITS

Figure A.3: Setup Comm Port 1

- 16 Set all data as shown in the screenshot. Click OK.
- 17 Connect the cable to the NQ-Series and PC (For the Modbus slave this means a proper RS-232 or RS-422 connection.) Refer to A-2-3 NQ-Series to PC. Connect the female port of the cable to the PC port and connect the male port of the cable to COM1 port of the NQ-Series.
- 18 Enter **123** in the NQ-Series' screen. If the connection has been correctly established the same value is shown in ModSim.

Note

A-2 Non-Omron devices to NQ-Series configurations

- The NQ-Series establishes a connection to the slave by exchanging a default address HR400020. If this
 address is not available in the slave, the connection will not be established. To establish the connection
 proceed as follows.
 - 1 Click in the **Nodes** folder and right-click the Node1 inverter.
 - 2 Click Edit.
 - 3 Click PLC Specific Setting.

Default communication register Type Holding registers •	Broedcart Settings For Cont
Address Top and	r-Broadcast evotie bit
(drees est) (12	T 0 100-991
Note : This register is used to test communication with the device to see if the device is connected and to check if settings are proper.	- Hodbus Register Start Address
Mothus Command	Type Calk
Force Modbus command 15 and 16 for single point selles.	Addece 1 (1 to 65535.)
(This is used in case where Slave does not support single point write functions 05 and 05.)	PZH Reporter Staf Address
4 Bytes Fermat	0.1c 100c0 1011
F High Word - Low Word	10.10.11
C Low Word - High Word	Pro al Pagatera
2 Bytes Farmel	C Francisco 0 (0 100040 999)
Figh Byte - Low Byte	
C Low Byte - High Byte	



- 5 Change **Default communication register** address to an available address in the slave.
- 6 Click OK.

•

- 7 Download the application to the NQ-Series.
- The following messages are displayed on the NQ-Series' screen if problems occur:
- III no connection
- ??? connection established, address unknown

A-2-2 NQ-Series as Modbus Slave and ModScan (Master-Simulation Software)

To perform a successful communication proceed as follows.

1 Right-click the **Nodes** folder and click **Add...**.

Node Information Name	Node 1	Max 1 chun		1	(0 to 255)
Interhanie Delay	0	(0 to 3000) mi	Response Time Dut	800	(10 to 6000) mi
Retry Court	2	(Bts5)		PLC SamituSet	litiga
Selicit Parter					
Plat - Ethernet PLC IP Address	Con1	-	Protecol Construction Setting:	J (Unital Slave) lave	•
Part	192 192 2 100	(010 99526)	Model MODBUS SI		

Figure A.5: Node information

- 2 Set all data as shown in the screenshot.
- (Note that the scan time of the master is set lower then the response Time out (default 800ms)) 3 Create PLC tag with **HR40001**.
- 4 Add a Data Entry object with tag address HR40001 on screen1.
- 5 Download the application and firmware to the NQ-Series.
- 6 Open ModScan.
- 7 Click New on File menu.

Image: Second	ModScan32 - ModScal							
Image: International and the international andifferenal andifference and the international and the internatio	File Connection Setup Mee	• Window Help						
Image: International and the international andifferenal andifference and the international and the internatio								
Address: DUD1 Device Id: 1 MODBUS Point Type Number of Polls: 0 Valid Slave Responses: 0 Length: IU0 B1: COIL STATUS P Reset Ctrs Reset Ctrs ODD01 00028 00028 00028 00028 00046 000055 000 00064 000073 000073 000073 000073 000073 000073 000073 000073 000073 000073 000073								
Address: Device Id: 1 MODBUS Point Type Number of Polls: 0 Valid Slave Responses: 0 Length: 100 01: COIL STATUS • Reset Ctrs ** Device MOT COMMECTED! • • Reset Ctrs 00001 00010 03 00015 08 00028 00 DB037 00 DB046 00 000855 03 00084 <0 00073 03 00074 03 00074 03 00074 03 00074 03 00074 03 00075 03 000855 03 000855 03 00074 03 00074 03 00074 03 00075 03 000855 03 000855 03 00075 03 00075 03 00085 000855 03 00075 03 000855 03 00075 03 000855 03 00075 03 00075 03 000855 03 00075 03 000855 03 00075 03 00075				_	_			isioi xi
Address: DB01 MODBUS Point Type Number of Polls: 0 Length: 180 01: COLL STATUS Paild Slave Responses: 0 ** Device MOT CONNECTED(** 00801 0011 0001 00015 00028 00 00046 00 00855 00 00064 00 00073 00 00073 00 00074 00 00075 00 000855 00 000865 000864 00 00073 00 00074 00 00075 00 000855 00 000864 00 00073 00 00075 00 000855 00 000855 00 000864 00 00075 00 000856 00 000757 00 000856 00 00077 00 000856 00 00077 00 00077 00 00077 00 00077 00 000856 00 00077 00 000856 00 00077 00	Contraction of the second s							C. Dellas
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••• Device NOT CONNECTED! •• 00001 <0>00010 <0>00019 <0>00028 <0>00037 <0>00046 <0>00055 <0>00064 <0>00073 <0>00073 <0>00074 <0<00055	Length: 100	01: COIL STATUS	New York Courts and					
GDB01 <0>00010 <0>00010 <0>00010 <0>00011 <0>00010 <0>00011 <0	1.560 CA			and the second sec				
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00007 <0> 00016 <0> 00025 <0> 00034 <0> 00043 <0> 00052 <0> 00052 <0> 00061 <03 00070 <0> 00079 <0> 00080 00008 <0> 00017 <0> 00026 <0> 00035 <0> 00044 <0> 00053 <0> 00062 <0> 00071 <0> 00080 <0> 00080 <0> 00080 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0 0081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00081 <0> 00								
00009 <0> 00018: <0> 00027: <0> 00036: <0> 00045: <0> 00054: <0> 00063: <0> 00072: <0> 00081: <0> 00081: <0> 00091	00007 <0> 00016	<0> 00025 (0) 00034	(D) 00043)	<0> 00052: <0>	00061: (0)	00070 <01	00079:	0> 00086
	*							

Figure A.6: ModScan32 - ModSca1

8 Set all data as shown in the screenshot.

9 Click **Connect** on **Connection** menu.

10 Select the PC port number to which the PC is connected.

	Bi	rection to COM rection Number 0	502		1
Configuration Baud Rote: Aford Langth: Parky: Stop Bits:	3600 8 EVEN 1	•	Hardware Flow Con	SR from slave TS from slave DISABLE	at abaraster Hacastar

Figure A.7: Connection Details

- 11 Set all data as shown in the screenshot.
- 12 Connect the cable to the NQ-Series and PLC (For the Modbus slave this means a proper RS-232 or RS-422 connection.) Refer to A-2-3 NQ-Series to PC. Connect the female port of the cable to the PC port and connect the male port of the cable to COM1 port of the NQ-Series.
- 13 Enter **789** in the NQ-Series' screen. If the connection has been correctly established the same value is shown in ModSim.

Note

- !!! no connection
- ??? connection established, address unknown

A-2-3 NQ-Series with AB DF1 Driver to AB SLC Series

To perform a successful communication proceed as follows.

1 Right-click the **Nodes** folder and click **Add...**.

Node Information Name	Node 1	Max 15 character	Addess	1	(0 to 255)
Intertrane Delay	0	(0 to 3000) ms	Response Time Out	[800	(18 to 6008) ms
Retry Court	12	(8ta5)	į.	PLC Spect	Settinge
Seriest Seriel Pierter COMP					
Select Protocol - Port	Com1	• Pr	Alen Bradey	DF1	•
-Ethernet PLC		Mo	del SECTION	e upto St	
IP Address	1152.162.2.100	0	centrurication Settings		
			Baud Rate 9500		Dhu .
PUC Port	10 (D to 19526 J	19600	T Data	B#1 8 💌
PUC-Port	<u>(</u>	D10 985261	Party None	• Stop	-

Figure A.8: Node Information

- 2 Set all data as shown in the screenshot.
- 3 Create PLC Integer tag with address N007000.
- 4 Add a Numerical Data Entry object with tag address N007000 on screen1.
- 5 Download the application and firmware to the NQ-Series.
- 6 Open RS Logix500.
- 7 Click Channel Configuration on File menu.

Channel Configuration	÷			×
General Chan. 1 - Syste Driver Definition Baud 9600 Parity NONE Stop Bits 1 Protocol Control		an. D - User nce ID (decimal)		
Control Line No Hand	tshaking		ACK Timeout (x20 ms) 50	
	CRC	•		
Embedded Responses	Enabled	*		
	P Duplicate Packet Detec	a	NAX Retries 3 ENQ Retries 3	
	DK	Cancel	<u> épply</u> Help	

Figure A.9: Channel Configuration

- 8 Set all data as shown in the screenshot.
- 9 Download the application to the PLC.

- ALLAD 9-× / LAD 10 -# LAD 11 -# LAD 12 -17:0 Ő / LAD 13-N7:10 0 # LAD 14 -0 17:20 / LAD 15-N7:30 0 Data Files 87. 40 0 Cross Reference : 50 0 00 - OUTPUT 11 - INPUT N7:60 0 S2 - STATUS N7:70 Ó B3 - BINARY M7:80 0 T4 - TIMER N7:90 0 CS - COUNTER N7:100 0 RE. CONTROL N7 - NTE 4 Force Files N7:0 DO - OUTPUT Symbol 1 H - INPUT Custom Data Monitors Desc Custom Graphical Monitors N7 Properties Recipe Monitors
- 10 Open **Data Files** from the tree structure and select the N7 (Integer Register) and double-click on the N007000 register.

Figure A.10: Data Files

- 11 Connect the cable to the NQ-Series and PLC. Refer to A-3-1 NQ-Series to AB SLC Series.
- 12 Enter **123** in the NQ-Series' screen. If the connection has been correctly established the same value is shown in RS Logix 500 software.

Note

- !!! no connection
- ??? connection established, address unknown

A-2-4 NQ-Series with AB DF1 Driver to AB MicroLogix

To perform a successful communication proceed as follows.

1 Right-click the **Nodes** folder and click **Add...**.

Node Information Name	Node 1		Max 15	Addess	1		(0 to 255)
Interhanve Dekay	0	(0 to 300		Response Tim	e Dut (80	0	(18 to 6008)#
Retry Court	þ	(0to5)			FL	Steelide	liriga
Seriest Genel Pierter —							
E CDMH							
Felect Photocol -	Com1	•	Protoc	ol Mina	inadey DF1		
-Ethenet PLC			Protec	(allocation of the second seco	inactey DF1 ogix Series P	10	
Port	Con1		Model	(allocation of the second seco	ogix Series P	LC1	
Port			Model	Microl Microl	ogix Series P	LC:] Data Bits	
Pat - Etherner PLC IP Address	110.168.2.1	_	Model Com Ba	Micro Micro Noticetion Set	ogix Series P ingi		

Figure A.11: Node information

- 2 Set all data as shown in the screenshot.
- 3 Create PLC tag with address N007000.
- 4 Add a Data Entry object with tag address N007000 on screen1.
- 5 Download the application and firmware to the NQ-Series.
- 6 Open RS Logix500.
- 7 Click Channel Configuration on File menu.

Driver		m Chan. 0 - Sy	and the second second	oter [
Baud	9600	•	1 1	(interimal)		
Panity	NONE	•				
Stop Bits	1	1				
Protocol D	ontrol					
Control I Inc	No Han	dshaking		-	ACK Timeout (x20 ms) 50)
CONTOLLING				and the second second		
Error Detec	tion	CRC		+		
		TOPT	-	•		
Error Detec	Responses	TOPT			NAK. Retnes 3	

Figure A.12: Channel Configuration

- 8 Set all data as shown in the screenshot.
- 9 Download the application to the PLC.

LAD 9-/ LAD 10 -# LAD 11 -/ LAD 12 -17:0 Ő / LAD 13-0 N7:10 ELAD 14 -N7:20 0 LAD 15-317:30 0 Data Files 87 40 0 Cross Reference 1:50 0 00 - OUTPUT 11 - NPUT ō 17:60 6 S2 - STATUS N7:70 Ő. 6 B3 - BINARY N7:80 0 T4 - TMER N7:90 0 . CS - COUNTER N7:100 0 CONTROL 1 84. N7 - INTEG 4 Force Files N7:0 CO - OUTPUT Symbol 1 H - NPUT Desc Custom Data Monitors Custom Graphical Monitors N7 Propertie . Recipe Monitors

10 Open **Data Files** from the tree structure and select the N7 (Integer Register) and double-click on the N00700 register.

Figure A.13: Data Files

- 11 Connect the cable to the NQ-Series and PLC. Refer to A-3-2 NQ-Series to AB Micrologix Series. Connect the PLC end MiniDIN port to the AB DF1 Micrologix 1000 PLC. Connect the NQ-Series' male port of the cable to the COM1 port of the NQ-Series.
- 12 Enter **123** in the NQ-Series' screen. If the connection has been correctly established the same value is shown in RS Logix 500 software.

Note

- !!! no connection
- ??? connection established, address unknown

A-2-5 NQ-Series with AB DF1 Compact Logix Driver and AB Compact Logix L31

To perform a successful communication proceed as follows.

1 Right-click the **Nodes** folder and click **Add...**.

de Information							
Node Information Name	Node 1		fax 15 heacter	Addess	1	(0 to 2	55]
Intertrane Delay	0	(0 to 3000)ms	Response Time D	a [800	(1810	6000) ma
Retry Court	þ	(0to5)			PLC Sam	stideling	
Select Senal Pinter		ΠĨ					
Select Protocol Part	[Com1		Prote	col [Alen Brad	ey DF1 - Com	pactiogic (1768 e	nd1 💌
	[Com1		Mode	[seen and	ogie	pactiogic (1768 a	nd 1 💌
Pat - Ethernet PLC			Mode	(Record	ори	pacifogix (1763 a sta Bits 8	_
Pat - Etrevel PLC IP Address	110.168.2.1	-	Made Com B	f Research	ogia Di		•

Figure A.14: Data Files

- 2 Set all data as shown in the screenshot.
- 3 Create PLC tag with address N007000.
- 4 Add a Data Entry object with tag address N007000 on screen1.
- 5 Download the application and firmware to the NQ-Series.
- 6 Open RSLogix 5000 .
- 7 Click on **New** on file menu.
- 8 Create new project.
- 9 After PLC is selected above screen will be shown. Click on the PLC model and select CH0-system protocol Confirm if data is as shown below.

A-2 Non-Omron devices to NQ-Series configurations

)*-(Controller Logs-off)(controller)) Communications Lods Window Balo	
Controller gth Controller gth Controller gth Controller Tays Controller Fault Handler Controller Fault Handler Controller Fault Handler Passer-Lip Handler Tadis		نگر تقلم
Aventask Aventask	Professol DF1 Point to Point DF1 Point to Point DF1 Point to Point C BCC CBC Station Address II NAX: Receive Limit II NAX: Receive Limit II Embedded Responses Autodatect	

Figure A.15: Controller Properties

- 10 Switch to CH0 Serial port and set all data as shown above
- 11 Download the application to the PLC.
- 12 Open Controller Tags window from Monitor section and change the value in the N70 register.

	2 II 36 36 36	<u> 22</u> 23
Hine D. IT FILM I Forces P. IT DK IF BAT IT 1/0	Path (name)	and a second sec
Controller gth Controller Tags Controller Tags Controller Fault Handler Fore-Ligi Handler HainTask HainTask HainTask HainTask HainTask Differenced Ares Data Types Data Types Data Types Biodylare, Compacting Data Types Data Types	Controller Properties - gth OH0 - User Protecol CH1 - Senal Port CH1 - System P Date/Time Advanced SFC Execution File Baud Rate. Stop Data Biz. Data Biz. Party None Party None Cartral Line No Handshake F ^T Connctour Carter RTS Send Delay: 0 (s20 ms)	LID X otecol Major Faults Minor Faults Norvolatile Memory Memory DHD-System Protocol"

Figure A.16: Controller Properties

- 13 Connect the cable to the NQ-Series and PLC. Refer to A-3-3 NQ-Series to AB Compact Logix. Connect the PLC end port to AB DF1 Compact Logix L31 PLC. Connect the NQ-Series' male port of the cable to the defined COM1 port of the NQ-Series.
- 14 Enter **796** in the NQ-Series' screen. If the connection has been correctly established the same value is shown in RS Logix 5000 software.



Figure A.17: Controller Tags

Note

- !!! no connection
- ??? connection established, address unknown

A-2-6 NQ-Series with Siemens S7 (PPI) Driver and Siemens S7-200 Series PLC

To perform a successful communication proceed as follows.

1 Right-click the **Nodes** folder and click **Add...**.

Node Information Name	Node 1	Max 15 charac		<u>[1</u>	(0 to 255)
Intertrative Delay	0	(8 to 3000) ms	Response Time Dut	800	(10 to 6000) ms
Retry Court	12	(0ta5)		PLC Saectorde	tiriga
Seriel Pinter Fri (DMI) Select Protocol - Pat	[Com1	1	Protocol Siemens Step	Steel Shorts	
P Address	[1121102.2100			L FLUE	
PLC Port	(1102.1528.2.1029 (0	(0 to 99526)	Communication Settings - Baud Rate 9600 Party Even - Power On PLC Comm	Data Bits Stop Bits	8

Figure A.18: Node information

- 2 Set all data as shown in the screenshot.
- 3 Create PLC tag with address MW0000.
- 4 Add a Data Entry object with tag address MW0000 on screen1.
- 5 Download the application and firmware to the NQ-Series.
- 6 Open STEP 7-Micro/WIN.
- 7 Click Communications in project window and click then on Communications ports.

Communication Ports Communication Port settings all continunicate to a given PLC.	ow you to adjust the communication parameters that STEP 7-Micro/WIN will use to
System Bock.	Communication Posts Defaults
Input Pities Pake Catch Bits Background Time Bits Bits	Port 0 Port 1 PLC Address: 2
	Configuration parameters must be downloaded before they take effect.

Figure A.19: Communication Ports

8 Set all data as shown in the screenshot.

9 Download the application to the PLC.

10 Click Status chart in project window and enter MW0000 in the screen. Monitor the values in the field.

		in the second	and the second second	B B B & P 6	
	高田 本学学校 聖空	マゴヒナト	E-07-11		
View	III - Project1	Status Chart			
	CPU 221 REL 01.10		1.1.1.3.1.1.1.1	+ 4 + + + + + + + + + + + + + + + + + +	6 7 .
	🖻 🛅 Piogram Block	Address	Format	Current Volue	New Value
	H GI Symbol Table	1 Mwti	Unsigned *		
	USER1	2	Signed		
	E Data Block	4	Signed		
nicol Table	(# The System Block E Cross Reference	2	Signed		
	8 P Communications				
atus Chart	🛞 🙀 Wareds				
	🗟 🎝 Tosh 🕀 💽 Instructions				
ER.	Favoiles				
ate flock	🗄 📷 Bit Logic				
	S-GO Clock.				
	B Compare				
dem Block	E- Convert				
_	E Courtess				
+• `	E Integer Math				
a Reference	E miterrupk				
	E- 20 Legical Operations				
n=					
5	E Move E M Program Control				

Figure A.20: Status chart

- 11 Connect the cable to the NQ-Series and PLC. Refer to A-3-4 NQ-Series to Siemens S7-200 Series. Connect the PLC end port to the Siemens S7-200 PLC. Connect the NQ-Series male port of the cable to the defined COM1 port of the NQ-Series.
- 12 Enter **10** on the NQ-Series screen. If the connection has been correctly established the same value is shown in Step 7 MICRO/WIN Siemens software.

Note

- !!! no connection
- ??? connection established, address unknown

A-2-7 NQ-Series with Siemens S7 (MPI) Driver and Siemens S7-300 Series PLC

To perform a successful communication proceed as follows. Note that only **1 to 1 connection** is supported from NQ-Series.

1 Right-click the **Nodes** folder and click **Add...**.

Node Information Name	Node 1		Max 15 character	Addess	1	(0 to 255)
Interhanve Delay	0	(010300		Response Time Dut	1000	(10 to 6000) m
Retry Court	1	(Bto 5)			PLC Specification	Hiriga
Select Secol Pierter —						
E (CDMIT)						
Select Protocol	-		8.4	ntal Canada 67		
Pat	Com1		1100	score 5aemena 5.7-	300 Series PLCs	
Part In Ethernet PLC	Com1	1		Determine pro-		
	Com1		Mod	ti S7 300 serie		•
-Ethernet PLC			Mad	Determine pro-		•
- Ethernet PLC IP Address			Mod Cor	I S7 300 serie	e PLCa	8

Figure A.21: Node information

- 2 Set all data as shown in the screenshot.
- 3 Create PLC tag with address MW0000.
- 4 Add a Data Entry object with tag address MW0000 on screen1.
- 5 Download the application and firmware to the NQ-Series.
- 6 Open SIMATIC Manager.
- 7 Click **Properties** on **File** menu.

Properties - MPI	and the second		×
General Network Settings			
Highest MPI address:	3) <u>-</u>	Owner	
Internetisalon rake:	19.2 Köpe 1975 Köpe 1.5 Möpe 6 Möpe 1.2 Möpe	• ×	
DK.		Cancel	Help

Figure A.22: Network Settings

- 8 Set all data as shown in the screenshot.
- 9 Download the application to the PLC.

10 Click PLC/MODIFY Monitor Variables on PLC menu.

		nt FLC Variable	Werv Options W	iridaus Hielp	ା ପାଳ କା କା କା ଲା
1		ablet ONLINE			
T	Address	Display formet	Status value	Modify value	
	MW 0	HEX	W#16#0000		
1					

Figure A.23: Variable table

- 11 Connect the cable to the NQ-Series and PLC. Refer to A-3-5 NQ-Series to Siemens S7-300/400 Series. Connect the PLC end port to the Siemens S7-300 PLC. Connect the NQ-Series' male port of the cable to the defined COM1 port of the NQ-Series.
- 12 Enter **3000** in the NQ-Series screen. If the connection has been correctly established the same value is shown in SIMATIC Siemens software.

Note

The following messages are displayed on the NQ-Series screen if problems occur:

• !!! no connection

• ??? connection established, address unknown

A-2-8 NQ-Series with Mitsubishi FX PLC

To perform a successful communication proceed as follows.

1 Right-click the **Nodes** folder and click **Add...**.

Node Information Name	Node 1		lac 15	0.000		1		101-2051	
	hesoa 1		haste	Address		1	2	(0 to 255)	
Intertranie Dekay	0	(0 to 300)	D)ma	Respons	e Time Dut	800		(10 to 6000)==
Retry Court	þ	(0to5)				PLC I	Sectore 4	litiga	
Select Secol Pierter									
T (CDMI)									
	[Com1	•	Protei	col jį	ungen P	6			•
Select Protocol	[Cam1		Prote		Asubishi Raubishi	ζ			_
Select Protocol - Post	[Cosi1		Mode		Andrichi	{			•
Select Protocol Pat Ethernet PLC			Mode	1	Rubishi Settings		Data Bits	7	_
Select Protocol Part - Ethernet PLC IP Address	1102.160.2.100	_	Mode Com B	i ja munication	Rubishi Settings		Dute Bits Stop Bits	7	•
Select Protocol Part - Ethernet PLC IP Address	1102.160.2.100	_	Mode Com B P	i nuricatio aud Rate taity	9tu.bishi Settings 9500		Stop Bits		•

Figure A.24: Node information

- 2 Set all data as shown in the screenshot.
- 3 Create PLC tag with address **D0000** (Data Registers 1).
- 4 Add a Data Entry object with tag address D0000 on screen1.
- 5 Download the application and firmware to the NQ-Series.
- 6 Open the GX Developer.
- 7 Click Communications Setup on File menu.

Transfer Set		
PC ade 1/F		AF SSC coard nat
PLC side UF	PLC MARET/TIMA MARETIN COLLAR CHANNE (P)4	Bui It
Other Malicon	(include Pi-USB-AW / Pi-OU-USB-80) USD(GOT transporer/ mode) COM port No uppofication: OP Teaministion speed States	Connection shared list.
istuoli. sulte	C24 NET/G.10(H) NET(H) CC-Lek Ethernet	PLC type
o-existence		System image
etwolic route	C24 NET/G/10H1 NET/R) DC-Link Ethemet Accessinghost station Target R.C	06.
		Close

Figure A.25: Communication setup

- 8 Connect the cable to the NQ-Series and PLC. Refer to A-3-6 NQ-Series to Mitsubishi FX PLC (8 Pin Connector) or A-3-7 NQ-Series to Mitsubishi FRS Inverter. Connect the PLC end port to the Mitsubishi FX PLC. Connect the NQ-Series' male port of the cable to the defined COM1 port of the NQ-Series.
- 9 Enter **11** in the NQ-Series' screen. If the connection has been correctly established the same value is shown in Mitsubishi Series PLC software

MELSOFT series GX Develop	er (Unset project) - [Entry data	monitor-1)				보다
Drosect Edit Endimentace		ci Iooki Window Hak				_10 ×
	100 美家公 省省					
Program	I I 1	F# 1	Bma STOP	RAM		
1122121221212	1.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5	S LL	同語			
	NER BO F 2	回日息日	E [E] [E]			
	展開開作品	吉元 回 元 5	<u></u>	N N N	1. 2. 5.	
III - 20 (Uncet project)	Device	OB/OFF/Current	Secting value Connec	t Ceil	bevice comment	T/C setting value, Local label Reference program
Program D1						MAIN -
Coverent						Recently [
B Perameter						Stop monitor
E B Device memory						Register devices
						Dekto the device
						Delete all devices
						Device text
						Close
Project		- energy participation of a				
Ready		Franco I	ricst station			NUM d

Figure A.26: NQ-series' screen

Note

- !!! no connection
- ??? connection established, address unknown

A-2-9 NQ with Mitsubishi FRS Inverter and Mitsubishi FRS520E

To perform a successful communication proceed as follows.

1 Right-click the **Nodes** folder and click **Add...**.

Node Information Name	Node 1		ax 15 Address		1	(0 to 25	5]
Intertranie Delay	0	(0 to 3000		se Time Dut	800	(18 to E	000)m
Retry Court	þ	(8105)		į	PLC Specif	FisSettings	
Select Secol Pierter —		1					
T SIDMON							
Fill CDMIT Select Protocol Port	[Cam1		Protecol	Mitaubishi FR	5-500		
Select Parlocol Part Ethernet PLC	[Com1	1	1	Muttin	5-510		2
Select Parlocol Part Ethernet PLC		1	Model	Misialin Settings		aB#s ∫8	_

Figure A.27: Node information

- 2 Set all data as shown in the screen shot.
- 3 Create PLC tag with address A000 (Run Command).
- 4 Add an Advanced Bit Button task with Press task:
 - Write 2 to A000:
 - To run/start the drive frequency to Max Freq Defined
 - Write **0** to **A000**:
 - To stop the inverter frequency to Min Freq 00.0
- 5 Create PLC tag with address M000 (Link Parameter Exp) and C000 (Operation Mode).
- 6 Create PLC tag with address **D000** (Output Frequency).
- 7 Add a Numerical Data Entry object with tag address D000 with unsigned integer format of ###.## (5,2) on screen1.
- 8 Create the following task in Poweron Task:
 - Write **0** to **M000**:
 - To access any of the parameters
 - Write **0** to **C000**:
 - To run/stop the drive
- 9 Download the application and firmware to the NQ-Series.
- 10 TBD: Click **Display Panel** on **File** menu.
- 11 Press **Set** key unless you observe P0 and rotate the POT wheel unless display changes to P0 ton1 and check/set the following parameters:
 - n1: Station Number Define 1.
 - n2: Communication Speed 192 Default (i.e. for baud rate 19200 bps)
 - n3: Change it to zero
 - n4: Parity check change it to 0 for even parity
- 12 Connect the cable to the NQ-Series and PLC. Refer to A-3-7 NQ-Series to Mitsubishi FRS Inverter. Connect the end RJ PORT to the FRS520E Drive.

- 13 Press **Start/Stop** button on the NQ-Series' screen. The frequency is changed in **D000** parameter as well as on display of the Drive.
- 14 Enter **11** in the NQ-Series' screen. If the connection has been correctly established the same value is shown in Mitsubishi Series PLC software.

Note

- !!! no connection
- ??? connection established, address unknown

A-2-10 NQ-Series Twido Driver and Twido PLC

To perform a successful communication proceed as follows.

1 Right-click the **Nodes** folder and click **Add...**.

Node Information Name	Node 1		lax 15 Address		1	(0 to 255)
Interhanie Delay	0	(0 to 3000		re Time Dut	[800	(10 to 6000) m
Retry Court	þ	(0105)		1	PLC Specific3	lettiriga
Satisst Satisf Pierter						
E (2040)						
Select Protocol	-		Protocol [Twids PLCs		
Part	Com1		Provincion	LINGS PLUE		-
Fut	[Com1	1			14.	2
1923	[100:100.2.10			Tydh datu	PA.	
-Ethenet PLC			Model	Tedhilasta n Settings	Data Bi	•
- Ethernet PLC IP Address			Madel Communicatio	n Settings		• (8 🔮
- Ethernet PLC IP Address			Nodel Communicatio Baud Rate Party	n Settings 19 2k	Data Bit Stop Bit unication Time	• 8 *

Figure A.28: Node information

- 2 Set all data as shown in the screenshot.
- 3 Create PLC tag with address MW000.
- 4 Add a Data Entry object with tag address MW000 on screen1.
- 5 Download the application and firmware to the NQ-Series.
- 6 Open Twidosoft.
- 7 Click Controller Communication Setup on File menu.

ontroller Communica	itions Setu	ip	
Port 1			OK
Protocol			Cancel
<u>I</u> ype:	Modbus	-	Help
Address:	0	•	
Parameters			
Baudrate:	19200	•	
Data Bits:	8 (RTU)	•	
Early:	None	•	
Stop Bits:	1	•	
Besponse Timeout	10	x 100 ms	
Inter-frame delay :	10	ma	
			Adyanced.

Figure A.29: Controller Communication Setup

- 8 Set all data as shown in the screenshot.
- 9 Download the application to the PLC.
- 10 Open PLC memory window to observe the change in MW0000 values.

8		Program PLC W	140	Toggle Animation (PLC->Toggle Anim	
	11 (%	FS 16 100	19 9 12 /	8'8'6 8	0 ?
E TwDLMDA400-K	-	Address	Current	Retained	for
Hardware	1	164640	4560	0	Decinal
Pot 1 Hidour, 1	2	10.06.00	8534	0	Decisal
Post 2 : Remote Link, 1	12]		
Espansion Bus					
R 🐼 Software					
Constants					
Constants (KD)					
- 🛃 Constants (KF)					
spl Counters	/				
Ø Dirum Ceritoliera					
UF0/FIFC Registers					
TE SPLS/SPWM					
C Schedule Biecka					
· · · · · · · · · · · · · · · · · · ·					
-					
13 ¹ Very Fast Counters					
PID /					
Piogram /					
E Macros					
Es Comm					
- Drive					
Torus					
- E Teurs					

Figure A.30: Animation tables

- 11 Connect the cable to the NQ-Series and PLC. Refer to A-3-8 NQ-Series to Schneider Twido. Connect MiniDIN port of the cable to the PLC port. Connect the male port of the cable to the defined COM1 port of the NQ-Series.
- 12 Enter **4568** in the NQ-Series' screen. If the connection has been correctly established the same value is shown in Twido software.

Note

- III no connection
- ??? connection established, address unknown

A-2-11 NQ-Series with Schneider Modicon Driver and Schneider Quantum CPU 513

To perform a successful communication proceed as follows.

1 Right-click the **Nodes** folder and click **Add...**.

	0	1at actes	Addess		11		[0 to 255]	
0	(8 to 3000) ma	Response	Time Dut	800		(10 to 6000	l)mi
2	(0 to 5)			į.	FLC 5	aeth Ser	tiga	
Com1		Profe	col [5	chmexder - N	fadican			·
1071 1070 7 1070	-11	Mod	e 関	chineider M	odicien P	1.61		٠
					_	2000200		
0 (1) to £8526 (Laud Hate	9600	-	DataBiti	8	-
			¹ ady	Even	-	Stop Bits	1	٠
			Power On I	PLC Comm	ncation		Seconds (
	Com1	Com1	Com1 Prote 1952 1958 2 1959 1952 1958 2 1959 0 (Dito 20525) 8 8	Com1 Protecol [5] Hodel Comorication (D10 69526)	Com1 Protectal Schweider - N Model Schweider - N (Dis 2010) (Dis 2015) Baud Rate 9600 Party Even Power On PLC Comes	Com1 Protectal Schweider - Modean Model Permiser Modean (Dio 89526) Baud Rate (960) Communication	Com1 Protecol Scheeder - Modeon Model Scheeder - Modeon HSI 168 2 MB (D10 R0525) Baud Rate 9600 Data Bits Party Evan Stop Bits Power On PLC Communication Time	3 (Bto 5) Com1 Protecol Schweider - Madcun Model Schweider Modelen PLC (Dto 80526) Baud Rate 9600 Pathy Even Stop Bits Power On PLC Communication Time

Figure A.31: Node information

- 2 Set all data as shown in the screenshot.
- 3 Create PLC tag with address HR4 00001.
- 4 Add a Data Entry object with tag address HR4 00001 on screen1.
- 5 Download the application and firmware to the NQ-Series.
- 6 TBD: Open ProWorx32.
- 7 TBD: Click Communications Setup on File menu.

lected Communic		Modb
odbus Modbus Plus		
Resource Type	nications Setup	
Modbus Address	1	
Port	COM 1	
Baud Rate	9600	
Parity	Even	
Stop Bits	1	
Data Mode	RTU	
Timeout	3 Second	fs
Modem Type	None	
Change Setting	Modern Setup	Network Explorer

Figure A.32: Communication Setup

A-2 Non-Omron devices to NQ-Series configurations

- 8 Set all data as shown in the screenshot.
- 9 Download the application to the PLC.
- 10 Open Data Watch window from Data Editors section of the Pro Worx software.

Ele Edit Yew Project Contro	oller ∑erver Utilities Window Help	
90 10 20 10 10	👗 🔁 🞦 🖓 🏤 🚯 💹 🔳 🔍 🔍	9 9 m III
	ISHRT ADD SUB MULT DIV	· 🕺 🕸 - 🗐 -
	🗙 🔃 Watch 🛛 🛄 Sr	readsheet
Traffic Cop	Address	Data
Communications	40001	3
- 🏦 Logic	40002	801
😑 🔛 Data Editors	40003	940
🕘 Data Watch Windo	40004	12821
- Register Editor	40005	4660
- A PID Summary	40006	51901
- B Drum/ICMP Summa	40007	0
HMI View	40008	4692
-22 Configuration Extension	40009	0
	40010	0
	40011	40556
rojects Project Info	40012	34153
Nxt_demo 984-A145 - MB: 1	40013	34146
SIMPLE Quantum 534	40014	0
	40015	8532

Figure A.33: Data Watch Window

- 11 Connect the cable to the NQ-Series and PLC. Refer to A-3-9 NQ-Series to Schneider Nano. Connect the PLC end port to the Schneider PLC. Connect the NQ-Series' male port of the cable to the defined COM1 port of the NQ-Series.
- 12 Enter **3** in the NQ-Series' screen. If the connection has been correctly established the same value is shown in ProWorx Schneider PLC software.

Note

- !!! no connection
- ??? connection established, address unknown

A-2-12 NQ-Series with Schneider Modicon Nano Driver and Schneider Quantum CPU 513

To perform a successful communication proceed as follows.

1 Define the setting in **Node Configuration** window of NQ-Designer as shown below.

Node Information			12				
Name	Node 1		e 15 Address Racter		1	[0 to 25	51
Interhane Delay	(u	(0 to 3000)	na Respone	e Time Out	808	(10 10-6	000) -
Rehy Count	3	(0105)			PLC Specific	: Setings	
Felect Secial Pointer							
	Conl		Protocol	chneider - N	lano (Schweide	r Nano-PLCa)	
Select Protocol Pot			Comunication	Settings			9
Select Protocol Pot	Conil (152 168 2 108) 		and the second s	lano (Schweide Data B		6
El conn Pat Chanai PLC IP Addres	192 168 2 108	to the second	Comunication	Settings		ks B	
El conn Pat Chanai PLC IP Addres		(0 to 65526)	Communication Baud Role Party	Settings 19.2k Ddd	Data B	As B	2 2

Figure A.34: Node information

- 2 Define the PLC Tag Address MW000 on unit screen.
- 3 Download the Application and Firmware in Unit.

To define the Settings in PLC through PL7Pro Software please follow the following steps.

Using PL7Pro as a client

TSX is a server client protocol. So PLC software PL7Procan also be one client.

To work the software as a client ,some setting has to do. The settings are as follows :

- 1 click on the PLC menu. Click on "Define PLC Address"
- 2 Click on options



Figure A.35: Options

- 3 Keep wait time as 1000 or 2000
- 4 Click on Configuration of the drivers
- 5 This will pop up a window



Figure A.36: XWAY Drivers management Properties

- 6 Click on Unitelway driver.
- 7 Click on configuration
- 8 This will pop up an another window :

Here you have to add the number of nodes in Station List that are actually going to be present on your network. If not defined the software will send the EOT to all the tokens except his token. If you had not defined the node then software will send EOT (0x04) to your token also and as you are also sending the command when received your token, then bus contamination will occur. To avoid this define the nodes in station list, so the software will not send the EOT to your client number.

1	StationID	Port	Patoword	PhoneNumber	Parity
6	(Default) 04	COM1 COM1			0.66

Figure A.37: UNITELWAY Configuration

9 Click on the station ID on default and click on the Edit This will popup a window:

Station Parameters	X
Unitelway Line Parameters Advanced	
Station ID (Default)	
COM Pot	
UNI-TELWAY Slave Address Base 1 Sumbers 1	
Modem Communication	
Hayes	
Phone Number	
Password	
OK Cancel	_

Figure A.38: Station Parameters

Here keep base as 1 and numbers as 1 10 Click on line parameters

Baud Rate	-5-	
	19200 bpc	-
Sell Adaptatio	n (in sec)	tecond
Data Bits (* 7 bits (* 8 bits	Parity Ddd C Even C None	Stop Bits (* 1 bit (* 2 bits
RTS/CTS De	-	👿 🗙 100 ms
	Default	

Figure A.39: Station Parameters

Set the baud rate, data bits, parity and number of stop bits. Click on OK and return to Station List window 11 Now add the stations that will be in your network.

Here we want the node 04, so we added that. Enter the Line parameters and Unitelway parameters keep base as 1 and numbers as 4.

Keep the pointer on default station.

Click $\ensuremath{\textbf{Apply}}$. This will apply the settings by resetting the Unitelway driver.

The following message will appear



Figure A.40: Resetting the Unitelway driver

Click on OK

12 Click on tools. Click on configurations. The following picture will appear:



Figure A.41: Configuration

Double click on comm. The new window will appear :

1 TSX 3721 [POSITION 00.01]		
Configuration •	1	
CHANNEL 0 . CHANNEL 0 .	I MAST I	
Tipe Master Former Angement Corr Manber of staves Server abbress (ADD) Master of addresses Corr Het Server (ADD) Corr Het Server (Transmission speed Transmission speed Valt time Valt	

Figure A.42: Configuration - Number of slaves

Keep number of slaves as 5.

In order to increase the communication speed keep the slaves as are in your configuration. This will reduce the number of token sent from the server i.e. the server will send only those number of tokens. This completes the configuration of the PL7PRO software to act it as a client.

13 Connect the cable to the NQ-Series and PLC. Refer to A-3-10 NQ-Series to Schneider Modicon. Connect the PLC end port to the Schneider PLC. Connect the NQ-Series' male port of the cable to the defined COM1 port of the NQ-Series.

Following the above steps properly will form successful communication between NQ-Series defined with Schneider Nano Driver and PLC.

Note

- Communication parameters defined on the unit's COM1 port and in the PLC settings should match.
- Node ID Set in NQ-Designer node information and communications setup settings from the PLC settings should match.
- PLC cable connected between PLC port and NQ-Series' COM port should be selected correctly.
- Cable should be connected correctly.
- Select a correct tag address and the same tag should be embedded on the unit screen.
- The following messages are displayed on the unit screen if the notes above are not taken into consideration:
 - !!! no connection
 - ??? connection established, address unknown

A-3 Non-Omron devices communication cables

The non-Omron devices communication cables are not available from OMRON.

A-3-1 NQ-Series to AB SLC Series



DB9 FEMALE PINOUTS (PLC)



DD\$ I EMALE I		DD\$ MALE I	
Signals	Pin number	Pin number	Signals
	1	1	
RXD	2	 2	TXD
TXD	3	 3	RXD
	4	4	
SG	5	 5	SG
	6	6	
RTS	7	7	
CTS	8	8	
	9	9	
Shield wire t	o DB9 body	Shield wire t	o DB9 body

A-3-2 NQ-Series to AB Micrologix Series

6• 7• 8• 3• 4• 5• 1• 2•

8 PIN MINI DIN CONNECTOR PINOUTS



	PLC)		BBO MALL I M	(i.i.d.)
Signals	Pin number	7	Pin number	Signals
	1		1	
SG	2		2	TXD
	3	$1 \rightarrow -1$	3	RXD
RXD	4	¬ ∖ [4	
	5	1 /	5	SG
	6	٦ / ٢	6	
TXD	7	Γ	7	
	8		8	
	-		9	
shield wire	to DB9 body][shield wire to	DB9 body

A-3-3 NQ-Series to AB Compact Logix



DB9 FEMALE PINOUTS (PLC)

Signals	Pin number			
	1			
RXD	2			
TXD	3			
	4			
Common	5			
	6			
RTS	7			
CTS	8			
	9			
shield wire to DB9 body				



DB9 MALE PINOUTS (NQ)

Pin number	Signals			
1				
2	TXD			
3	RXD			
4				
5	SG			
6				
7				
8				
9				
shield wire to DB9 body				

A-3-4 NQ-Series to Siemens S7-200 Series



DB9 MALE PINOUTS (PLC)

Signals	Pin number	
	1	A
	2	
В	3	
	4	
SG	5	
	6	
	7	В
A	8	
	9	
shield wire	to DB9 body	



DB9 MALE PINOUTS (NQ)

Pin number	Signals
1	TX+
2	
 3	
4	RX+
5	SG
6	
7	
8	TX-
9	RX-
shield wire t	o DB9 body

A-3-5 NQ-Series to Siemens S7-300/400 Series

А

В



DB9 MALE PINOUTS (PLC)

Signals	Pin number	
	1	
	2	
В	3	_
	4	
SG	5	_
	6	
	7	
А	8	_
	9	
shield wire	to DB9 body	F



DB9 MALE PINOUTS (NQ)

Pin number	Signals
 1	TX+
2	
3	
 4	RX+
 5	SG
6	
7	
 8	TX-
 9	RX-
shield wire	e to DB9 body

A-3-6 NQ-Series to Mitsubishi FX PLC (8 Pin Connector)



8 PIN MINI DIN CONNECTOR PINOUTS



••••••	(PLC)	-		
Signals	Pin number		Pin number	Signals
RX-	1		1	TX+
RX+	2		2	
SG	3		3	
TX-	4		4	RX+
	5	\neg \land \checkmark	5	SG
	6		6	
TX+	7		7	
	8		-8	TX-
			9	RX-
s	hield wire to body		shield	wire to DB9 body

A-3-7 NQ-Series to Mitsubishi FRS Inverter



8 PIN MODULAR CONNECTOR



	inverter)			
Signals	Pin number	7	Pin number	Signals
	1		1	TX+
	2		2	
RX+	3		3	
TX-	4		4	RX+
TX+	5		5	SG
RX-	6		6	
SG	7		7	
	8		8	TX-
			9	RX-
shield wir	re to ground		shield wire to	DB9 body

A-3-8 NQ-Series to Schneider Twido

6• 7• 8• 3• 4• 5• 1• 2•

8 PIN MINI DIN CONNECTOR PINOUTS



(F	PLC)			
Signals	Pin number] [Pin number	Signals
A	1		1	TX+
В	2		2	
	3		3	
	4		4	RX+
	5		5	SG
	6		6	
SG	7		7	
	8		8	TX-
			9	RX-
shield w	ire to body][shield wire to	DB9 body

A-3-9 NQ-Series to Schneider Nano



8 PIN MINI DIN CONNECTOR PINOUTS



DB9 MALE PINOUTS

Signals	Pin number		Pin number	Signals
А	1		1	TX+
В	2		2	
	3	\neg \land $ $	3	
	4	┤ \ └┤	4	RX+
	5		5	SG
	6		6	
SG	7		7	
	8		8	TX-
			9	RX-
shield w	ire to body][shield wire to	DB9 body

A-3-10 NQ-Series to Schneider Modicon



DB9 MALE PINOUTS (PLC)

Signals	Pin number	
	1	
RXD	2	
TXD	3	
DTR	4	
SG	5	
DSR	6	
RTS	7	
CTS	8	
	9	
shield wire t	to DB9 body	



DB9 MALE PINOUTS (NQ)

	Pin number	Signals	
	1		
	2	TXD	
	3	RXD	
	4		
	5	SG	
	6		
	7		
	8		
	9		
	shield wire to DB9 body		

Revision history

Revision history

A manual revision code appears as a suffix to the catalogue number on the front cover of the manual.

Cat. No. V07-EN-02



The following table outlines the changes made to the manual during each revision. The page numbers of a revision refer to the previous version.

Revision code	Date	Revised content
01	June 2009	First version
02	May 2011	