

QUICK START MANUAL for NT2S-SF121B-E

While writing this document, It is assumed that the user is well acquainted with the PLC being used and with Windows based software usage, in general.

[Hereafter, in the manual, NT2S-SF121B-E will be referred to as NT2S A.]

Industrial automation

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What does the unit do?

The *NT2S A* connects to YOUR PLC over its programming or standard communications port. It is capable of displaying screens based on conditions in the PLC and is capable of changing data in the PLC registers/coils. It can also print screen text over the serial port.

What does the unit have?

The *NT2S A* has the following functional blocks:

- u 10-30 VDC power supply
- u 2 lines of 16 character backlit LCD
- u 6 keys keypad
- u 2 LEDs for annunciation
- u 8K / 32K EEPROM memory for PLC driver and screens
- u RS232C Port to connect the PLC for programming
- u RS232C Port to connect the PC for programming and also for printing
- u RTC

How does the unit work?

The *NT2S A* must be configured for YOUR application. It stores the configuration details and screens in its memory. Based on conditions in the PLC the configured screens are displayed. When a key is pressed, the configured action is taken. The unit continuously communicates with the PLC to detect conditions for displaying screens, to control the 2 LEDs on the unit and for its internal operations.

How are screens displayed?

Each screen has a unique number. The *NT2S A* scans a user definable register called as Screen Triggering Register (STR) in the PLC. To display screen number "XXX", simply put the number "XXX" in this STR. Valid screen numbers are 1 to 65528.

Normal screen are used to monitor status or alarms. A screen can have register values or bit controlled text embedded in it which is dynamically updated. RTC related data can also be embedded. Special screen are used to change data in the PLC or to turn a coil ON or OFF.

Link screen defines a list of screens that can be viewed consecutively by pressing the NEXT or PREV keys.

What are screen attributes?

A normal screen can flash or scroll on the display. Any screen can be assigned to be sent to a serial printer. A screen can be assigned only to the top line, bottom line or both lines.

A minimum time can be assigned to ensure that the operator has enough time to view the screen. If the PLC calls other screen in this time, they will be stored on a queue inside the unit. The maximum queue size is 3 screens.

What do the keys do?

The keys on the *NT2S A* can perform user defined functions. The same keys can be used to change data or to scroll through a list of screens. The operation of keys depends on the type of screen being displayed as follows:

Type of screen	Key operations
Normal	All keys perform user defined functions as configured by the software
Special (with data entry)	Arrow keys, CLR and ENT keys are used to change data. NEXT and PREV keys act as function keys.
Link	NEXT and PREV keys are used to scroll through the list of screens. Other keys act as function keys.

For all both line screens, the keys can be redefined to perform user defined task which can be different from global key task.

How are LEDs controlled?

The *NT2S A* scans a user definable register called the LED register. The least significant 2 bits in this register are mapped to the LEDs. If a bit is ON, the corresponding LED is turned ON.

How can data be entered?

There are two ways to edit data using the *NT2S A*. One way is to use function keys. The function keys can download a constant or can increment / decrement assigned register value or can change a coil status. However, the number of keys is limited.

Another method is to use a special screen which allows data entry. Here, the format in which data is edited is user definable. When this special screen is triggered, the operator can enter the new data using the arrow keys and the CLR and ENT keys. Coils can also be edited this way.

How is the unit configured?

Each unit **MUST** be configured using the Windows based setup software provided with the unit. The software is quite easy to use and contains comprehensive online help.

Invoke the NT2 ST software that is installed on your PC.

The software can be used either from the pull down menus or by using the comprehensive Toolstation that appears on the bottom half of the Window. Each tool has balloon help associated with it to help identify the function. If the Toolstation does not appear on your screen, it can be turned on using the "Options" pull down menu.

Select **NEW** project by clicking on the corresponding tool. A window will appear showing all the available products. Select the *NT2S A*. The bitmap of the unit will appear on the screen. Select your PLC from the list of available drivers. Also select the correct PLC model that you are using. The Toolstation now will allow you to configure the *NT2S A*. If any error screen indicating that "PLC driver is not found" appears, contact factory for support.

For any project, you must define the Tag database first. Tag is a register or coil which is used in your application. Tags can be defined by using either Edit-Tag database menu or Tag tool. A tagname can be assigned to each tag and the tag can be referred to by its name subsequently, making it very convenient to use. Tag database can be accessed from anywhere in the software. It is advised to define all the registers/coils you will be using in your project ahead of time.

Once the Tag database is defined, assign the STR and the LED register. This can be done using Edit-Setup menu or by clicking on the PLC-NT2S A link on the Toolstation. Use a bit addressable register as the LED register so that each LED can be easily controlled.

How are function keys configured?

To define the global task for the keys :

The *NT2S A* has 6 keys that can be assigned user definable functions by using the pull down menu of Edit-Function keys or by clicking on the *NT2S A* key tool on the tool station.

The dialogue shows the function keys along with the user assignable legends. Click on the key you wish to define, select the tag on which the key operates on and the action. Depending on what type of tag (bit or register) is selected, only actions that can be performed on that tag will be enabled.

**DO NOT USE THE FUNCTION BUTTONS
FOR EMERGENCY STOP APPLICATIONS!**

**It is advised that separate switches be used
outside the PLC for ANY emergency stops.**

To define the screen specific keys :

You can define the keys task, specific for the screen while editing the screen. You can click on the key to be redefined and configure the task as needed.

How are screens defined?

Screen text can be configured by using the Edit-Screen menu or by clicking on the Screen tool.

First the software will prompt you to enter the screen number to be edited or defined. If it is a new screen, then you will be asked to select the type of screen i.e. normal, special, link screen or function key.

The screen definition dialogue allows you to enter in your screen in a "what you see is what you get" format. Simply type in your text. To embed any dynamically animated register variable, press the "Embed Register" button. It allows you to select the tag as well as format the embedded data. It is possible to display register values in a bar graph format. Similarly, bit sensitive text can also be entered by pressing the "Embed bit" button. The text when bit is ON as well as when the bit is OFF can be entered here.

The screen dialogue allows editing of the screen attributes. Note that a scrolling screen text can not flash. If chaining is used then the "chained to" screen must be defined.

A list of screen texts called a link screen can be defined. It allows you to pick a list from the already defined screens and these screens can be viewed by pressing the NEXT or PREV keys. This mode can be simulated in the software itself. A standard Drag and Drop format can be used for this definition.

How to download to the unit?

The project can be downloaded to the *NT2S A* by selecting the *Communicate-Download to Unit* menu or by clicking the link between the PC and *NT2S A* on the toolstation. Connect the PC to the unit for downloading on the serial port. Use a simple straight through DB9 cable.

System requirements for NT2S ST

- **Processor** : 386 or higher.
- **Windows** : 3.1 or higher.
- **Screen Display** : VGA or better, Color monitor.
- **Mouse** : Optional.
- **Memory** : 2 MB or more.

The following programming sequence is suggested

- Start a new project. Select *NT2S A* and PLC model.
- Create the Tag database.
- Set the STR.
- Set the LED register.
- Program in screens.
- Define the function keys, if applicable to your application.
- Save your work to disk.
- Download work to Unit.

Note on RTC

The RTC values are downloaded in the PLC as follows :

Register LED + 1	----	Seconds	(SS)
Register LED + 2	----	Minutes	(MI)
Register LED + 3	----	Hours	(HH)
Register LED + 4	----	Day of week	(Sunday = 0)
Register LED + 5	----	Date	(DD)
Register LED + 6	----	Month	(MM)
Register LED + 7	----	Year	(YY)

The RTC can be set in the Unit as follows:

During the power-on sequence, press the F1 + F3 keys together.

NT2S A will go in the RTC setting mode. You can set individual values for the RTC in a menu format. NT2S will show you the current value for each field and ask you to enter the new value for the field. This can be done just as any other data entry, using the UP, LEFT, CLR and ENT keys. You can scroll through this menu list and set all the values for RTC as needed. These values will be in effect immediately.

You can embed each field in the RTC just like any other register. The format for embedding is \$\$\$. The tags for each RTC field are predefined in the Tag database, as soon as a new project is created.