Touch Graphical Interface Application Notes **code 9IS24295-1 - rel. 30.07.13**

Touch Graphical Interface

Contents

DEFINITIONS

- **DIAL SWITCH** Other name for "Dip Switch"
- **TOUCH VOICE** Other name for "Buzzer"
- **HMI** Human Machine Interface
- **Macro** 'C' language subroutine
- **PLC** 'Programmable Logic Controller i.e FREE Smart or Evolution
- **Modbus 'special':** Modbus commands 10 and 6 only
- **BB "Bit Button":** Binary button (0/1) e.g trigger

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GENERAL DESCRIPTION

Target of this document is to give the basic information to develop a Touch-Screen project as interface with an Eliwell Controls device.

SKWorkshop V4.0 tool is the instrument to develop the project.
Run the CD on your computer and follow the specific instruction to install.

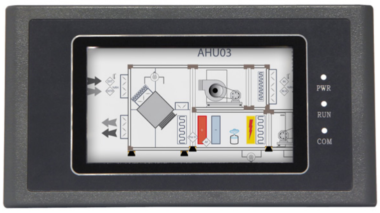
For more information please refer to following documents

Available Literature

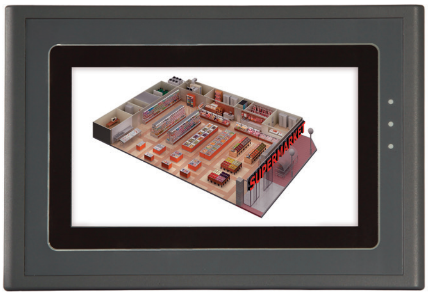
		Languages			
Data Sheet	**CT123179/80/81**	EN	IT	DE	Overview
Instruction Sheet	**9IS24278**	EN	IT	-	Installation instructions
User Manual	**9MA10234**	EN	-	-	Full SKWorkshop description

TGI MODELS

3.5"



4.3"



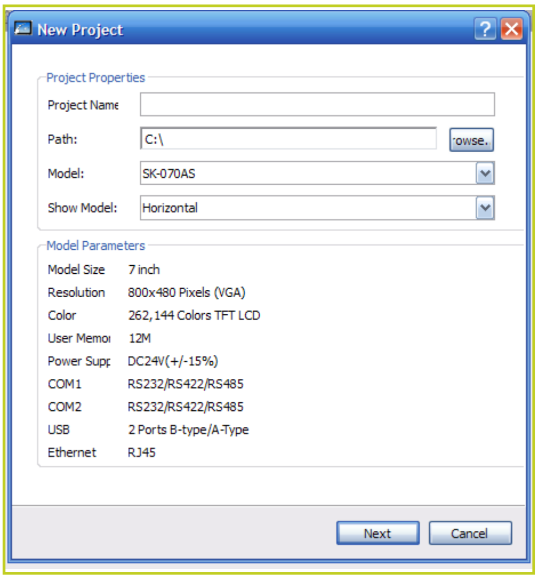
7"

Models	**TGI035AE**	**TGI043AS/B**	**TGI07AS**
p/n	**TGI**0350100400	**TGI**0430110400	**TGI**0700210400
TFT LCD display	4:3	16:9	16:9
Dimensions	3.5"	4.3"	7"
Resolution	320x240	480x272	800x480
Colours	262144	262144	262144

USB DRIVERS
See APPENDIX

INITIAL SETTINGS

In the main menu, select *File (F)* , then *New Pro (N)*
In the window define the **Project Properties** i.e. *Project Name, Path, type of screen* and *Model.*



Project Properties

Project Name:

Path: C:\

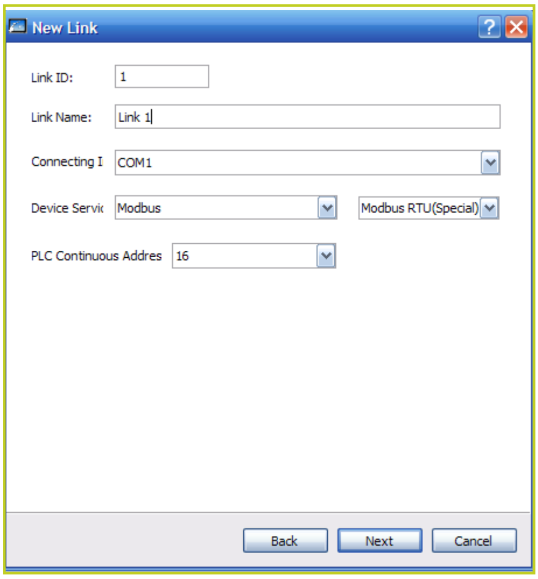
Model: SK-070AS

Show Model: Horizontal

Model Parameters

Model Size	7 inch
Resolution	800x480 Pixels (VGA)
Color	262,144 Colors TFT LCD
User Memoı	12M
Power Supp	DC24V(+/-15%)
COM1	RS232/RS422/RS485
COM2	RS232/RS422/RS485
USB	2 Ports B-type/A-Type
Ethernet	RJ45

A second window will follow to define the serial communication channel and mode.
See example: the connecting channel COM1 uses Modbus protocol i.e. **Modbus RTU (special)**
It means Master : "special" defines that only command **10** is used instead of commands **10** and **6** to write registers.
Please note: also the **PLC Continuous Address** in the example is set to **16**,. These are the number of continuous registers readable or writeable, the number is depending from the electronic control used as Slave.



Link ID: 1

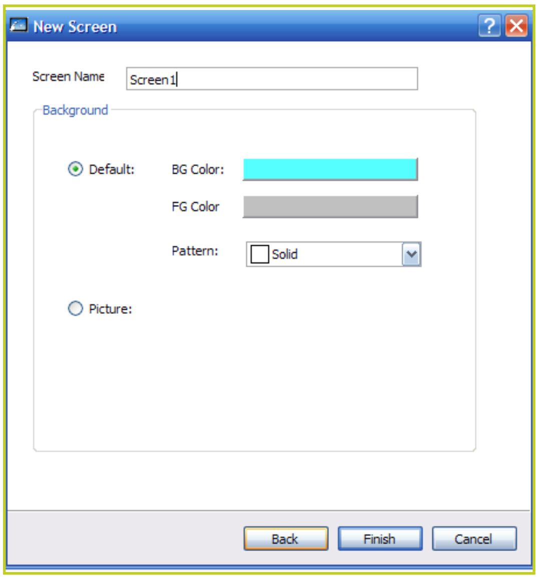
Link Name: Link 1

Connecting I COM1

Device Servic Modbus Modbus RTU(Special)

PLC Continuous Addres 16

The next window will define the starting screen color and shape.
You may select also a picture as screen background.



New Screen

Screen Name: Screen1

Background

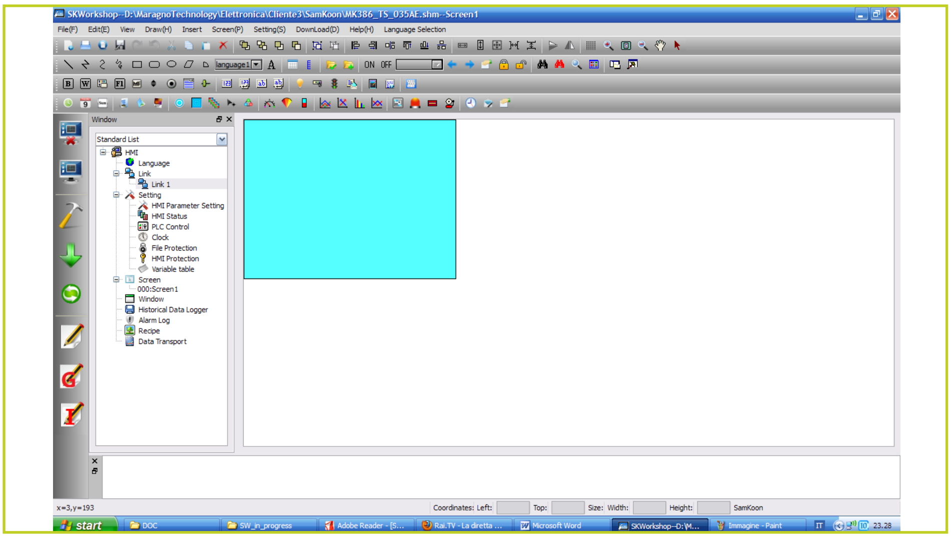
● Default: BG Color:

FG Color

Pattern: Solid

○ Picture:

The project appears as shown: previous settings could be changed at any time



SKWorkshop--D:\MaragnoTechnology\Elettronica\Cliente3\SamKoon\MK386_TS_035AE.shm--Screen1

By clicking on Link 1, it is possible to set

- Parameter for serial communication
- Baudrate
- …
- HMI Address (touch screen address)
- PLC address (it is the electronic control serial address),

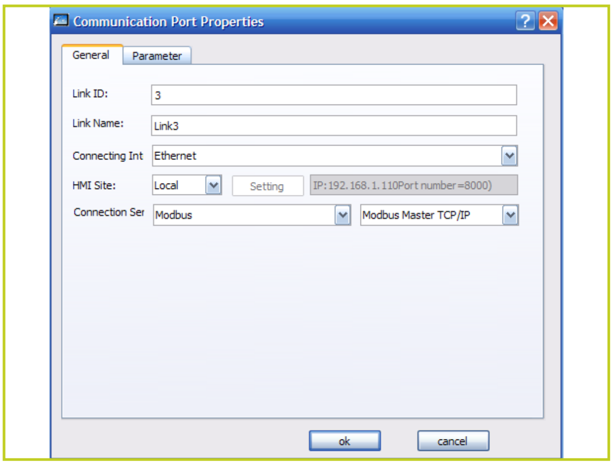
or leave default values for other parameters

Please Note. Only PLC Continuos Address has to be set considering the capability of electronic control regarding the maximum number of registers sending in the serial channel.

ETHERNET IP SETTING

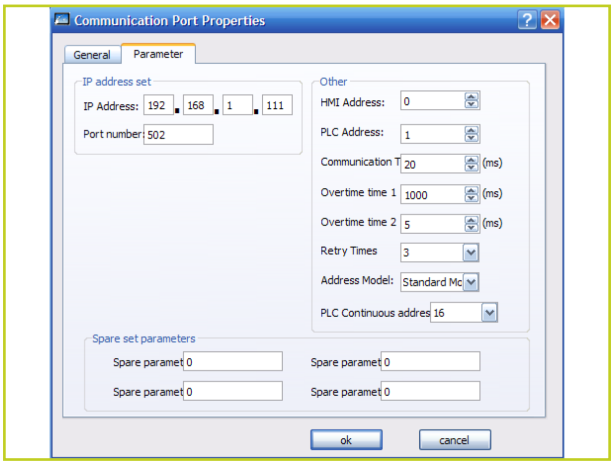
Alternative to 485 communication is, in some cases, the Ethernet line.
In such case as mandatory step set the IP address of HMI for first.
Each HMI has 5 dial switch, typically dip switches are all OFF. By setting dip1 & dip3 to ON, at the next power on, it will be possible to set a fixed IP address and other parameters.
Once you have set, turn the dip in OFF state again and turn off / on the HMI.

Master setting example


Communication Port Properties

General | Parameter

Link ID: 3
Link Name: Link3
Connecting Int: Ethernet
HMI Site: Local | Setting | IP:192.168.1.110Port number=8000)
Connection Ser: Modbus | Modbus Master TCP/IP


Communication Port Properties

General | Parameter

IP address set
IP Address: 192 . 168 . 1 . 111
Port number: 502

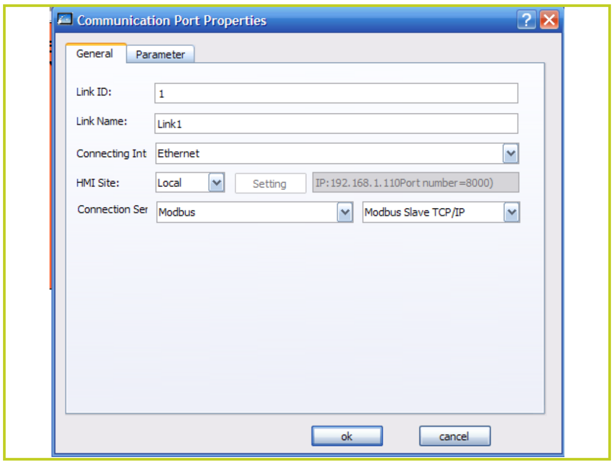
Other
HMI Address: 0
PLC Address: 1
Communication T 20 (ms)
Overtime time 1 1000 (ms)
Overtime time 2 5 (ms)
Retry Times 3
Address Model: Standard Mc
PLC Continuous addres 16

Spare set parameters
Spare paramet 0
Spare paramet 0
Spare paramet 0
Spare paramet 0

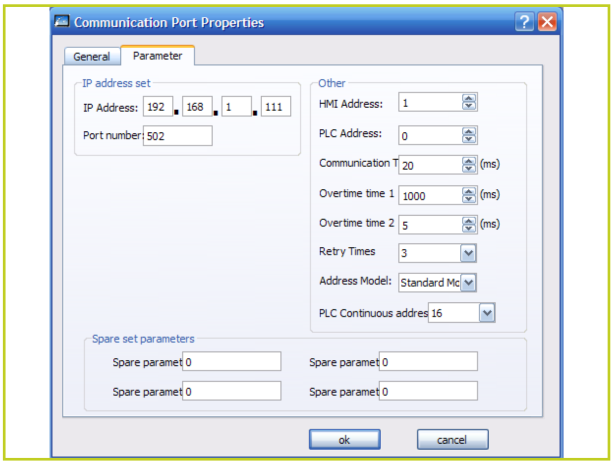
IMPORTANT NOTE.

IP address here above is the Slave IP address, where Master sends the message.

Slave setting example



Link ID: 1
Link Name: Link1
Connecting Int Ethernet
HMI Site: Local
IP:192.168.1.110Port number=8000)
Connection Ser Modbus
Modbus Slave TCP/IP



IP address set
IP Address: 192.168.1.111
Port number: 502

Other
HMI Address: 1
PLC Address: 0
Communication T 20 (ms)
Overtime time 1 1000 (ms)
Overtime time 2 5 (ms)
Retry Times 3
Address Model: Standard Mc
PLC Continuous addres 16

Spare set parameters
Spare paramet 0
Spare paramet 0
Spare paramet 0
Spare paramet 0

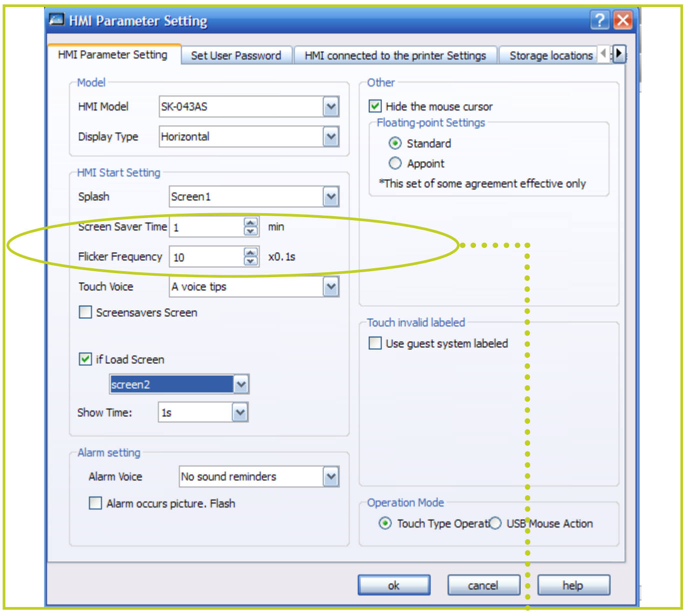
IMPORTANT NOTE. IP address here above is the IP address of slave itself, the same address defined by dip-switch or HMI.

Plaese Note: HMI and PLC Master/Slave addresses are swapped :
Master HMI address = 0
Slave HMI address = 1

Master PLC address = 1
Slave PLC address = 0

HMI PARAMETER SETTING

To set or to change the setting of HMI by clicking over HMI Parameter Setting, in the first page of this menu it is possible to define the type of the screen, the starting screen, the screen saver time and screen name, the enable of beep sound if a button is actived. There is also if Load Screen to set the first screen during start up, if not set a "demo" will appear.
In the Alarm Setting menu a beep sound can be set :it will occur in case of Alarm
(see Alarm Log for details).
Other pages as Set User Password, HMI connected to the printer Setting, Storage Location are available to define password to limit the access, to connect a printer and to save data in internal flash or connected memory (standard key).


HMI Parameter Setting

Model
HMI Model: SK-043AS
Display Type: Horizontal

HMI Start Setting
Splash: Screen1
Screen Saver Time: 1 min
Flicker Frequency: 10 x0. 1s
Touch Voice: A voice tips
□ Screensavers Screen
☑ if Load Screen
screen2
Show Time: 1s

Alarm setting
Alarm Voice: No sound reminders
□ Alarm occurs picture. Flash

Other
☑ Hide the mouse cursor
Floating-point Settings
● Standard
○ Appoint
*This set of some agreement effective only

Touch invalid labeled
□ Use guest system labeled

Operation Mode
● Touch Type Operati ○ USB Mouse Action

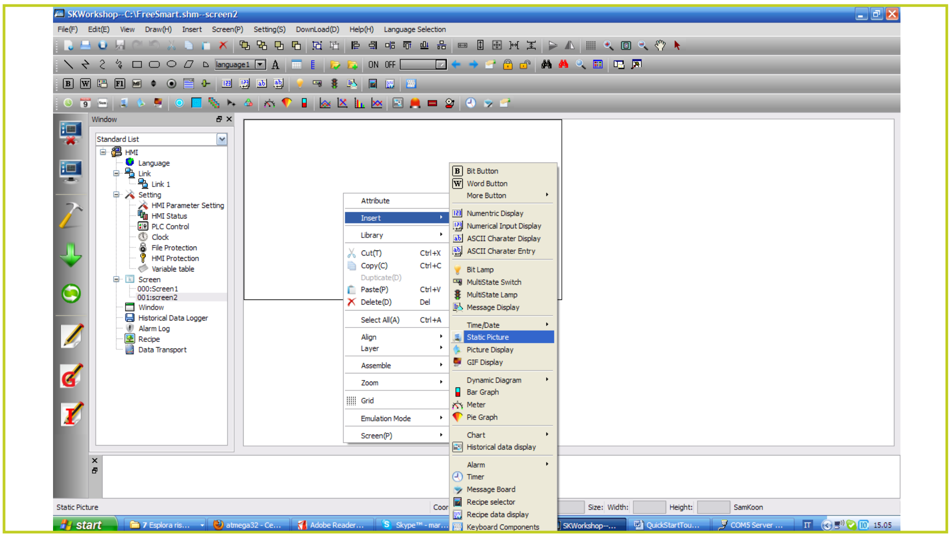
Disabling the buzzer

To disable the buzzer select “no sound reminders” option in the Touch voice combo box.
If the Buzzer has been disable the function bottom “Touch Voice sound on/off” is disabled

SCREEN DEFINITION AND OBJECT

The definition of screen is the core of develop, the other things are the setting of HMI considering the wished connection with external devices.
In a screen page it is possible to put as objects as wished, an object consist in images, or general graphic items to compose to obtain a figure, but overall numbers or information coming from or going to connected devices.
To switch between screens, a “screen button” can be used.
See following example.

Define a starting Screen, with only a picture, for example an “Eliwell” logo, right key of the mouse or by selecting Insert in the main menu, then select Static Picture, here you can select a picture from standard library or from your picture file.



After the “Welcome” screen, it is possible to define others screen containing the wished information, by object “Screen Button” is easy to move to different screens, then there are several objects to write a Text, to insert a Picture, to read/write a variable from Instrument, etc.
They are “intuitive, easy to use” functions, use the User manual for reference, and the examples into the listed applications at the end of this document.

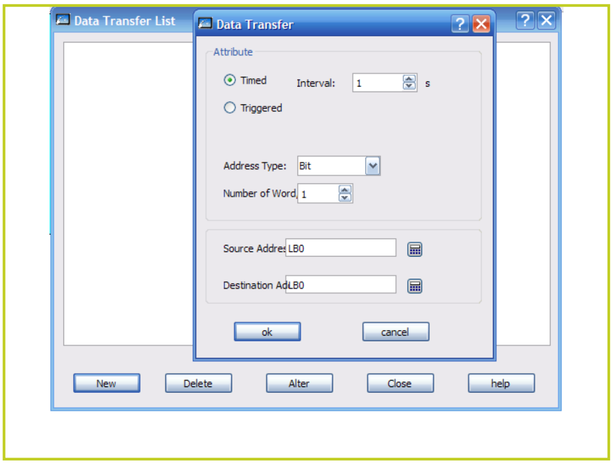
ALARM LOG

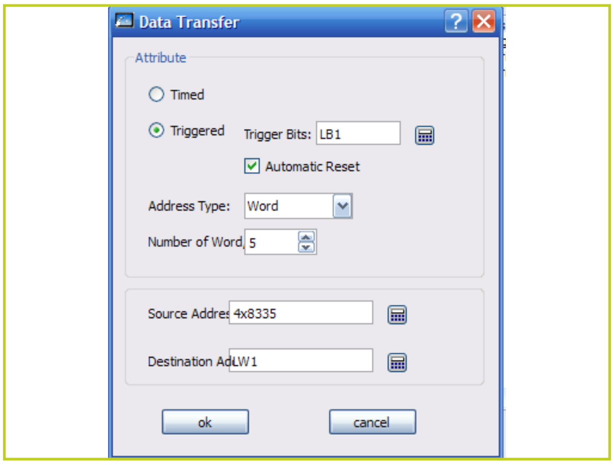
In standard list (project menu) of SKWorkshop, there is Alarm Log function. In this page is possible to check the status of one bit for each digital alarm, and the threshold (upper or lower limit) of one analog value for each analog alarm. To see the log with the alarm status is necessary to create a screen putting an Insert (top side main menu), then Alarm, then function Alarm Control or other similar available.
Note. HMI Parameter Setting of project menu, allows to set a beep sound in case of alarm.

DATA TRANSPORT

Below in standard list (project menu) of SKWorkshop, there is Data Transport function, it is an important function because it allows to send variables from one Instrument to another one, or from one Instrument to Touch Panel and/or viceversa.
It is enough to fill the Address field with Source and Destination address, and to define the event that produce the updating of the data exchanged, this event can be a trigger (variable to 1 defined by address) or a time, in this case it is necessary to set the time interval (in step of seconds, 1s minimum, in case of more transfer with the same time, only the last one will be executed).

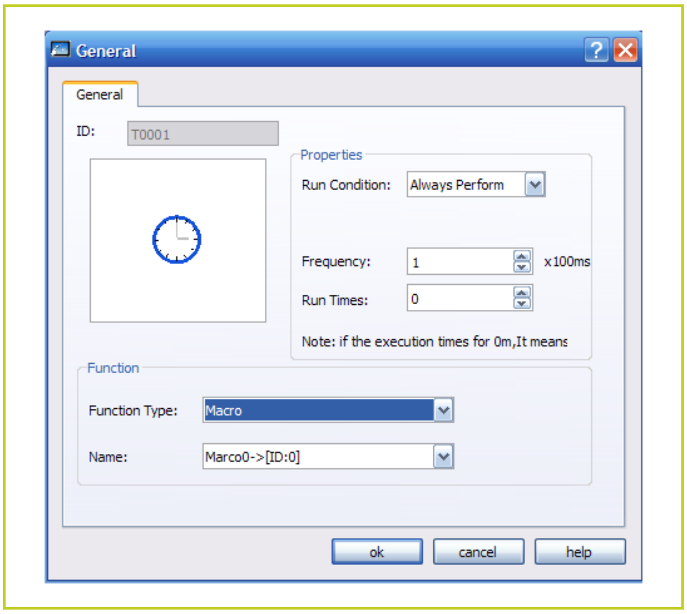
Then, this function can be used to transfer data coming from an external Source to internal memory as Destination, it allows to define and to adjust data addressed only in the Data Transport table, without the need to update all single menu.
Very useful a combination of Data Transfer function and macro, the best use of communication line between Instrument and Touch Panel consist to exchange variables regarding the only page displayed, to have speed updating of value.
To obtain this behaviour, in Data Transfer setting, set as Source the address variable and number of words (single variable or group of variables with successive addresses) of Instrument and internal storage LWxx as Destination, then set as trigger for this Data Transfer an internal storage variable LBxx and Automatic Reset.


Data Transfer List
Data Transfer
Attribute
● Timed Interval: 1 s
○ Triggered
Address Type: Bit
Number of Word: 1
Source Addres LB0
Destination Ad LB0


Data Transfer
Attribute
○ Timed
● Triggered Trigger Bits: LB1
☑ Automatic Reset
Address Type: Word
Number of Word: 5
Source Addres 4x8335
Destination Ad LW1

After that build a macro that set to 1 the over defined LBxx (see Macro paragraph for details), now in the menu where those variables shall be used, insert the "Timer" function (it is an object in the object menu) specifying the macro to be launch and its interval.

In the next picture, the object **Timer** call every **100ms** the macro **Marco0.**



ID: T0001

Properties

Run Condition: Always Perform

Frequency: 1 x100ms

Run Times: 0

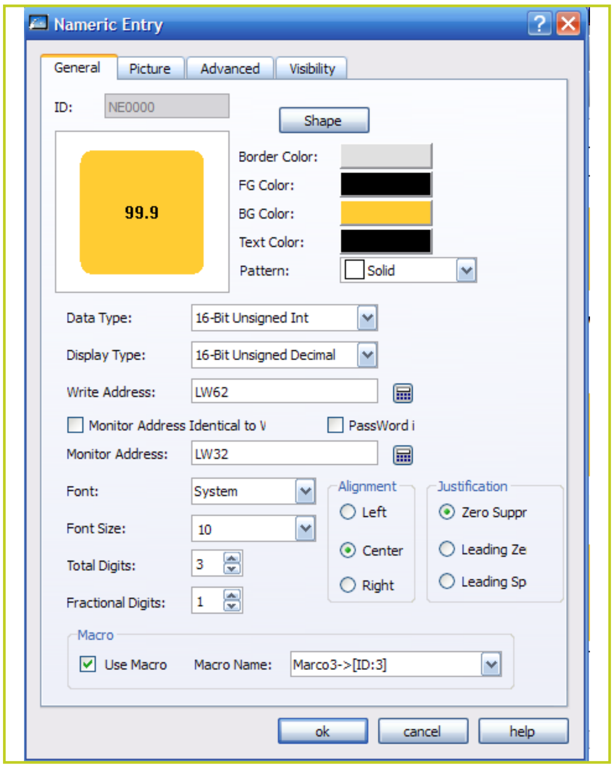
Note: if the execution times for 0m,It means

Function

Function Type: Macro

Name: Marco0->[ID:0]

IMPORTANT NOTE. Data Transfer works in one direction only, **Source to Destination**.
To update parameters or other, it is mandatory to create another transfer between former **Destination** (now Source) to former **Source** (now Destination).
in the next picture see a parameter definition where the read value is coming from internal storage LW32 and the written value is send to LW62, then exist 2 data transfer, the first one involve LW32 as Destination from Source specified Instrument address, the second one involve LW62 as Source to Destination the same specified Instrument address (note also the macro Marco3 used to produce the triggering to send this transfer).



ID: NE0000

Border Color:

FG Color:

BG Color:

Text Color:

Pattern: Solid

Data Type: 16-Bit Unsigned Int

Display Type: 16-Bit Unsigned Decimal

Write Address: LW62

□ Monitor Address Identical to V □ PassWord i

Monitor Address: LW32

Font: System

Font Size: 10

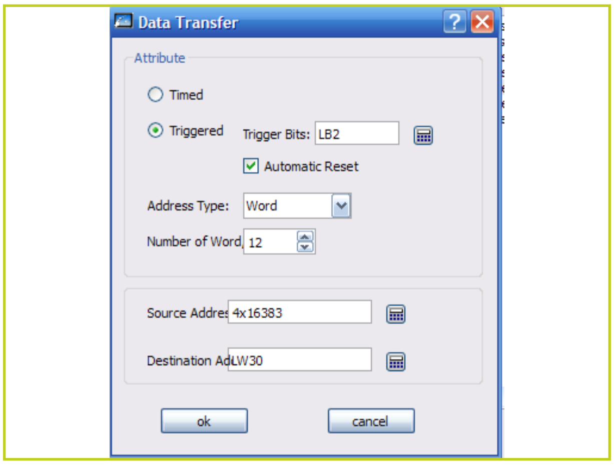
Total Digits: 3

Fractional Digits: 1

Alignment: ○ Left ● Center ○ Right

Justification: ● Zero Suppr ○ Leading Ze ○ Leading Sp

Macro: ☑ Use Macro Macro Name: Marco3->[ID:3]



Attribute

○ Timed

● Triggered Trigger Bits: LB2

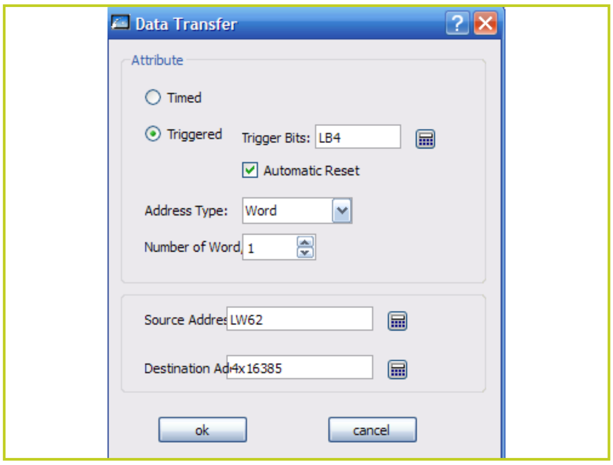
☑ Automatic Reset

Address Type: Word

Number of Word 12

Source Addres 4x16383

Destination Ad LW30



Attribute

○ Timed

● Triggered Trigger Bits: LB4

☑ Automatic Reset

Address Type: Word

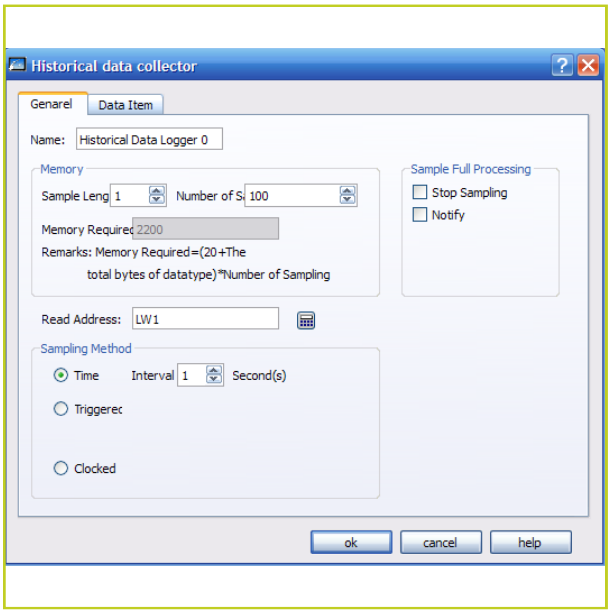
Number of Word 1

Source Addres LW62

Destination Ad 4x16385

HISTORICAL DATA

To collect data to be then used i.e. for graph, select in the project menu the function Historical Data Logger, in the following window select the variable to log and sampling details.



Historical data collector

Generel | Data Item

Name: Historical Data Logger 0

Memory

Sample Leng 1 Number of S 100

Memory Requirec 2200

Remarks: Memory Required=(20+The total bytes of datatype)*Number of Sampling

Sample Full Processing

□ Stop Sampling

□ Notify

Read Address: LW1

Sampling Method

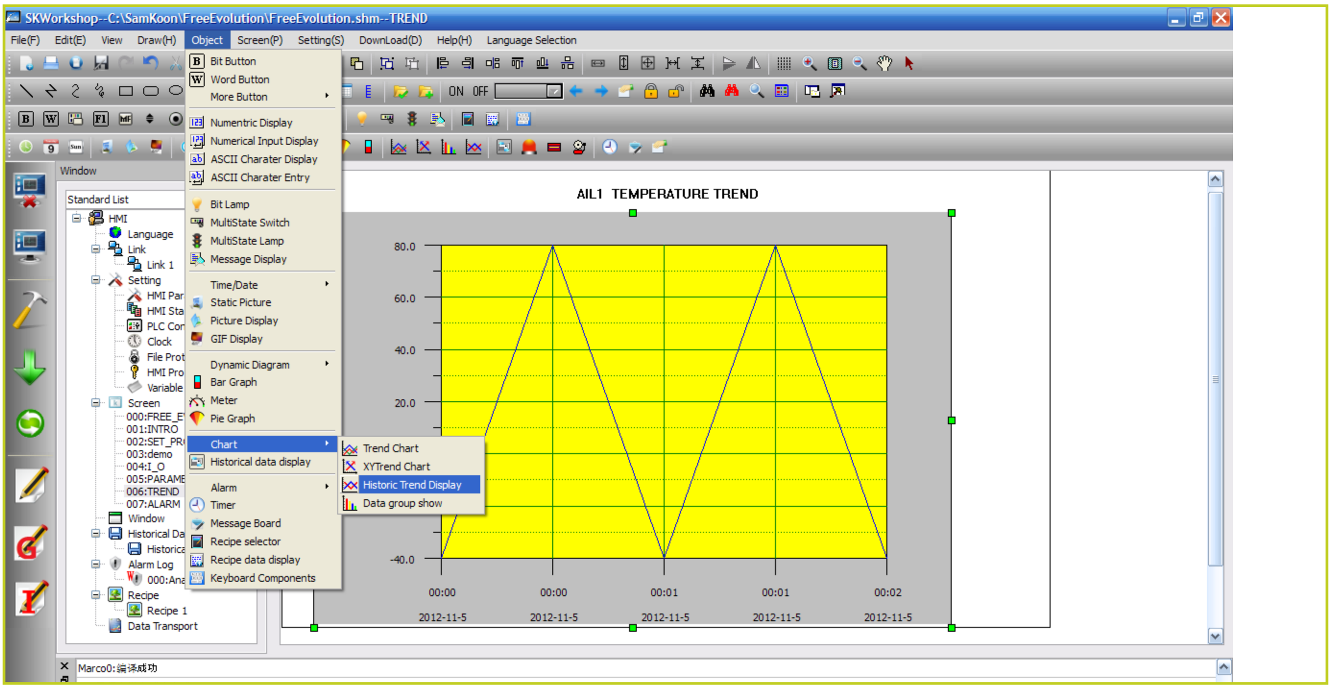
● Time Interval 1 Second(s)

○ Triggerec

○ Clocked

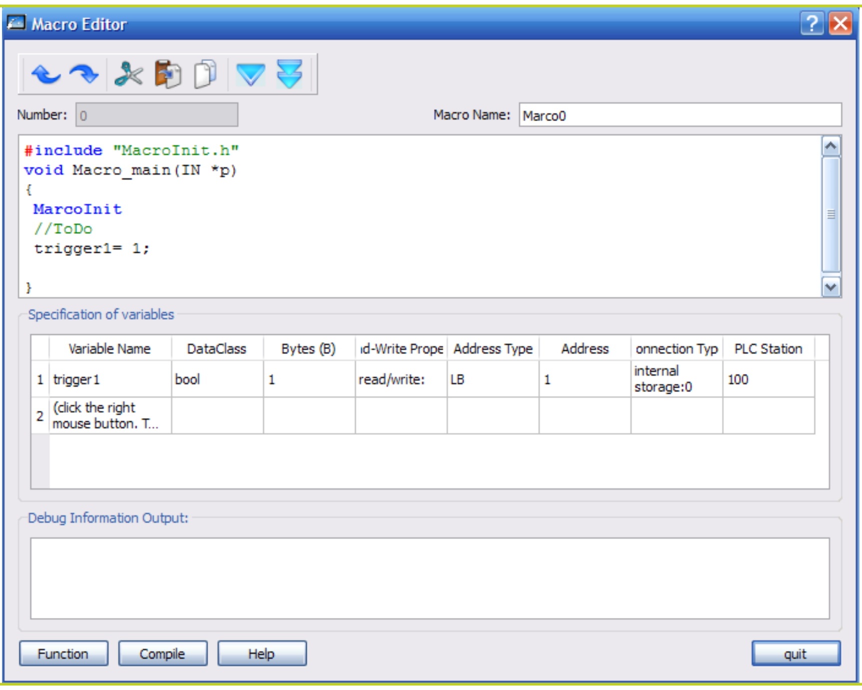
ok | cancel | help

To show the behaviour on variable under logging, select the opportune chart in the object menu.



MACRO

By action on it is possible to write a **Macro**.
The Macro are subroutine writable in C language, they can manage algorithm also complex, they can be triggered by Timer Object at specified time interval or by an event (i.e. button).
Here an example of macro used to set to 1 the variable trigger1, then used to trigger a Data Transport event.



Number: 0

Macro Name: Marco0

```
#include "MacroInit.h"
void Macro_main(IN *p)
{
 MarcoInit
 //ToDo
 trigger1= 1;

}
```

	Variable Name	DataClass	Bytes (B)	ıd-Write Prope	Address Type	Address	onnection Typ	PLC Station
1	trigger1	bool	1	read/write:	LB	1	internal storage:0	100
2	(click the right mouse button. T...							

WINDOW

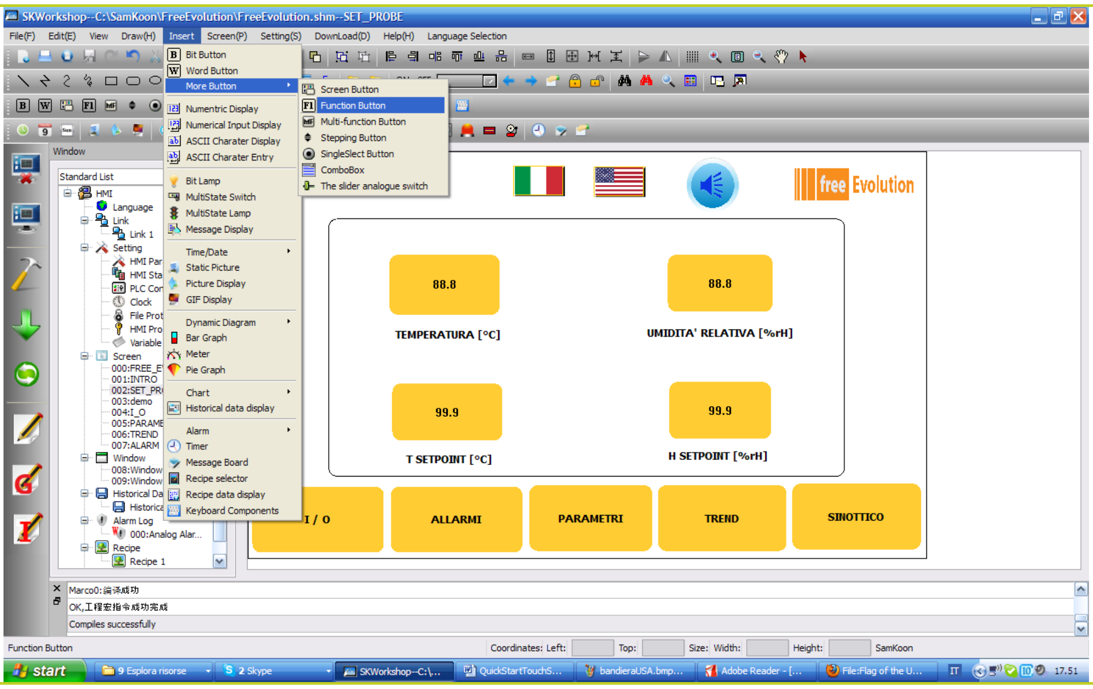
The definition of "Window" in the project menu is very close to **Screen** definition: the only differences are the size and position over the screen. To open a window over the current screen use a "screen button", in the same way for a screen, it is necessary to specify number of screen (here called window) to be opened.

RECIPE

Useful to write or to load a set of values to or from a Device.
With RECIPE it is possible to define the type of data with reference address, then send or to receive this recipe use **Functional Button**.

FUNCTIONAL BUTTON

Important action is reserved to functional button, it allows to perform touch panel setting, as selection language, buzzer on touch on-off, and other several functions.



```
Marco0:编译成功
OK,工程宏指令成功完成
Compiles successfully
```

CLOCK SETTING

Important thing to do is to set, if shown, the clock of HMI.
Each HMI has 5 Dial switch, normally these dial switches are OFF, set dip1 & dip3 to ON, at the next power on, it will be possible to set the clock and other parameters.
Once time has been set, set again the dip in OFF state, and turn off /on the HMI.

SIMULATION

Before to simulate the project, it is necessary to compile the project by clicking on

Knocker Image

By clicking on afterwards it is possible to debug the application.
The communication channel will be required, set the COM address of own PC, this COM has to be connected to external device with opportune tool.

DOWNLOAD TO HMI

Before to download the project to HMI, it is necessary to compile the project by clicking on

Knocker Image 🔨

Then clicking on ⬇ it is possible to download by USB or Ethernet cable the application.

DIAL SWITCH

On the back of Touch Panel a rubber cover is present. Under the cover 5 dial-switch, in OFF position as default, are available. Set dip 1 and 3 ON at successive power-on: the Touch Panel will show its internal set-up in terms of IP address, Time/Date, Backlight intensity, etc.
Change the settings: then turn OFF dip1 and dip2. At next power on the touch panel will work with new settings.

DOWNLOADS

Installation setup, USB drivers and documentation are also available from the Restricted Area of the website www.eliwell.com @

http://www.eliwell.it/content.aspx?id=29991

once you have registered.

Available Literature

		Languages			
App Notes	**9IS24295-1**	EN	-	-	document you are reading now
Instruction Sheet	**9IS24278**	EN	IT	-	Installation instructions
User Manual	**9MA10234**	EN	-	-	Full SKWorkshop description

USB DRIVERS
Available downloads

File for download
USB Driver 32 bit Win 7
USB Driver 64 bit Win 7

USE CASES
Available downloads

Eliwell Controllers	TGI	File for download
FREE Smart	**TGISK035AE**	**FREE SMART.zip**
FREE Smart / EWCM EO	**TGISK043AE/B**	**EWCM EO.zip**
FREE Evolution	**TGISK070AS**	**FREE EVOLUTION.zip**

In the next pages a brief description of the Use Cases available

NOTES

Projects simulation shall be loaded on your PC at following path C:\\SAMKOON

Win 7 users: Launch Samkoon.exe tool and after that open relevant project / use case

USE CASE FREE SMART (FILE: FREE SMART.zip)

What (SUPERVISOR):
R/W RAM/EEPROM locations (probes, status, alarms);
Set basic commands (ON/OFF, …);
Alarm Logging.

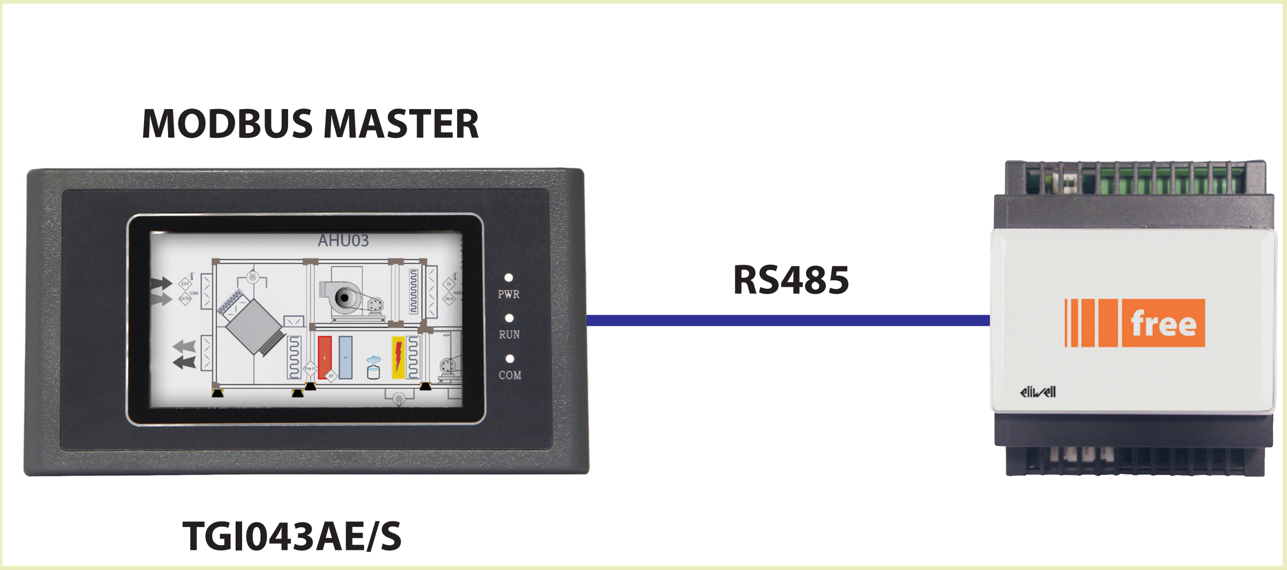
ModBus RTU Communication
Display number with with/without decimal point
Display Alarms List and Alarm Logging
Enumerators

Object/Function used

- TEXT;
- Static Picture;
- Bit Lamp;
- Screen Button;
- Numeric Display;
- Numeric Entry;
- Alarm Control.

Other

- Alarm Log;



FIELD RS485

NETWORK Ethernet

SUPERVISOR RS485/Ethernet

Connection
RS485 in ModBus RTU
Controller example
SK-043AS Touch Screen
FREE Smart

USE CASE FREE SMART_EWCM EO (FILE: EWCM EO.zip)

1) FREE SMART and SK-043AS Touch Screen

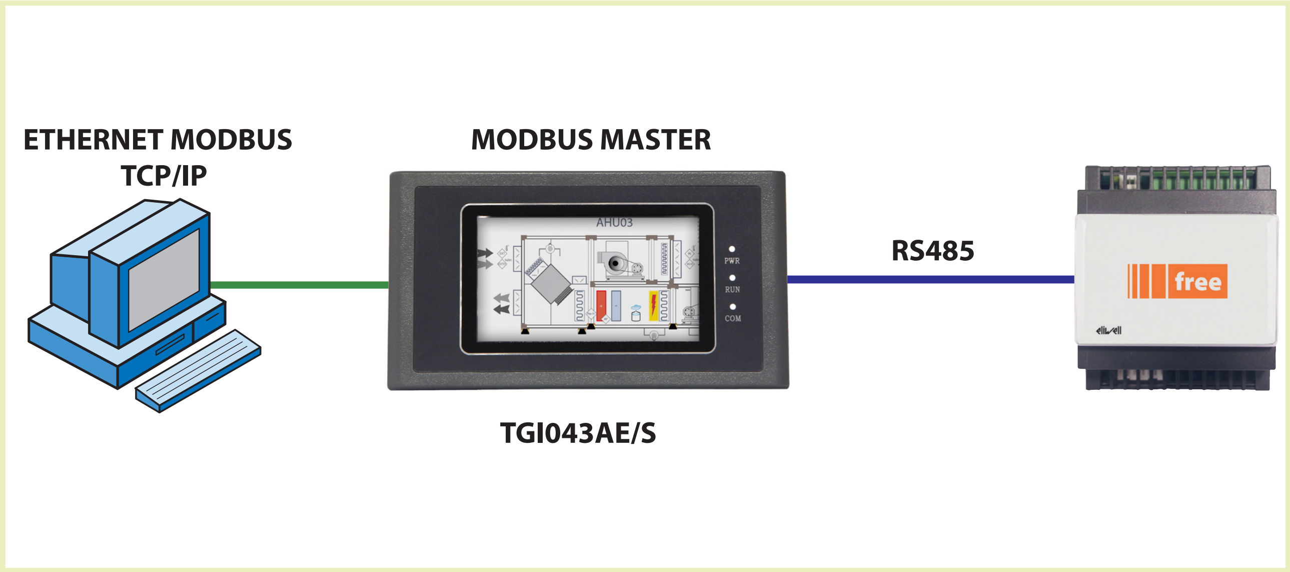
What (NETWORK):
Share variables (probes, status, alarms);
Set basic commands (ON/OFF, …).
What (SUPERVISOR):
R/W Controller Parameter and Variables, numeric and strings (Bridge);
Alarm Logging.

Object/Function used

- TEXT;
- Static Picture;
- Bit Lamp;
- Multistate Lamp;
- Bit Button;
- Screen Button;
- Numeric Display;
- Numeric Entry;
- Alarm Control.

Other

- Alarm Log.



FIELD RS485

NETWORK Ethernet

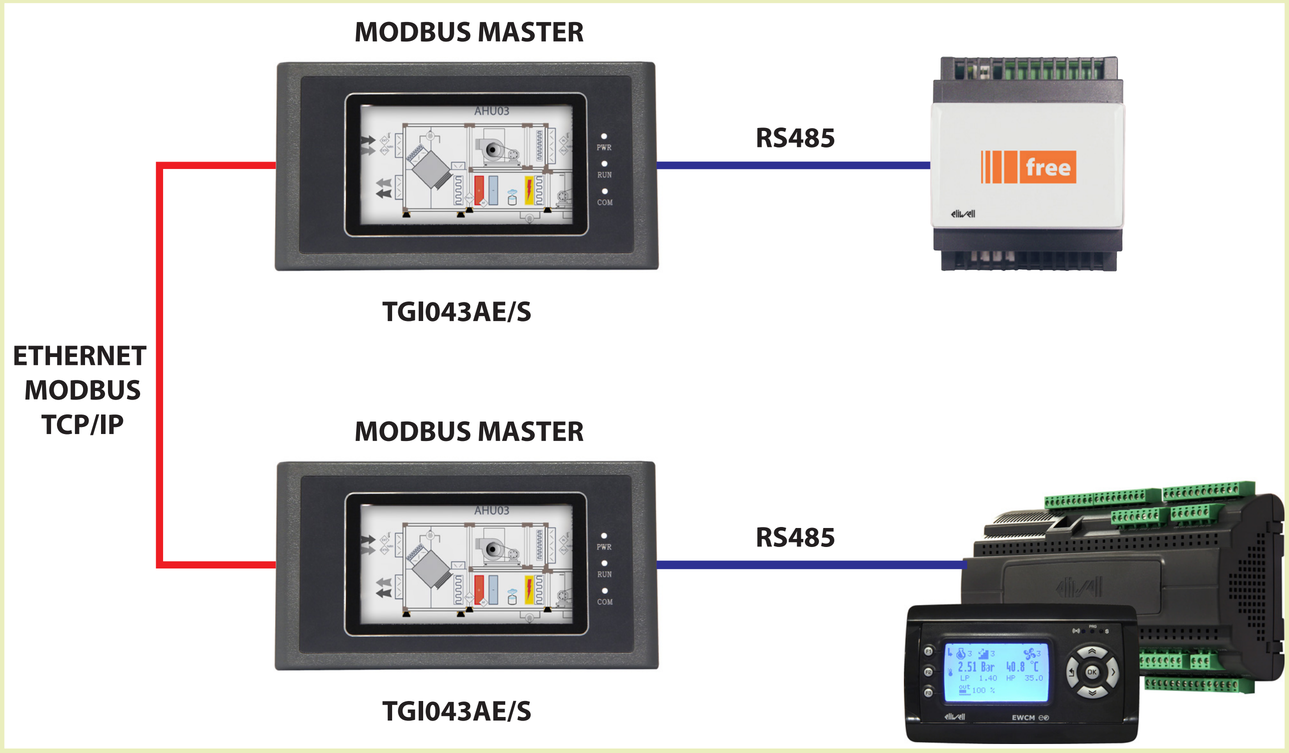
SUPERVISOR RS485/Ethernet

Connection
RS485 in ModBus RTU
Controller example
FREE Smart
EWCM EO

USE CASE FREE SMART (EWCM EO) (FILE: EWCM EO.zip)
2) EWCM EO (MK504) on SK-0070AS and SK-043AS Touch Screen

What (NETWORK):
Share variables (probes, status, alarms);
Set basic commands (ON/OFF, …).

What (SUPERVISOR):
Share variables (probes, status, alarms);
Set basic commands (ON/OFF, …);
R/W Controller Parameter and Variables, numeric and strings (Bridge);
Variables Logging.



FIELD RS485

NETWORK Ethernet

SUPERVISOR RS485/Ethernet

Connection
RS485 in ModBus RTU
Controller example
FREE Smart
EWCM EO

USE CASE FREE EVOLUTION (FILE: FREE EVOLUTION.zip)

1) FREE EVOLUTION (AHU03) on SK-070AS Touch Screen

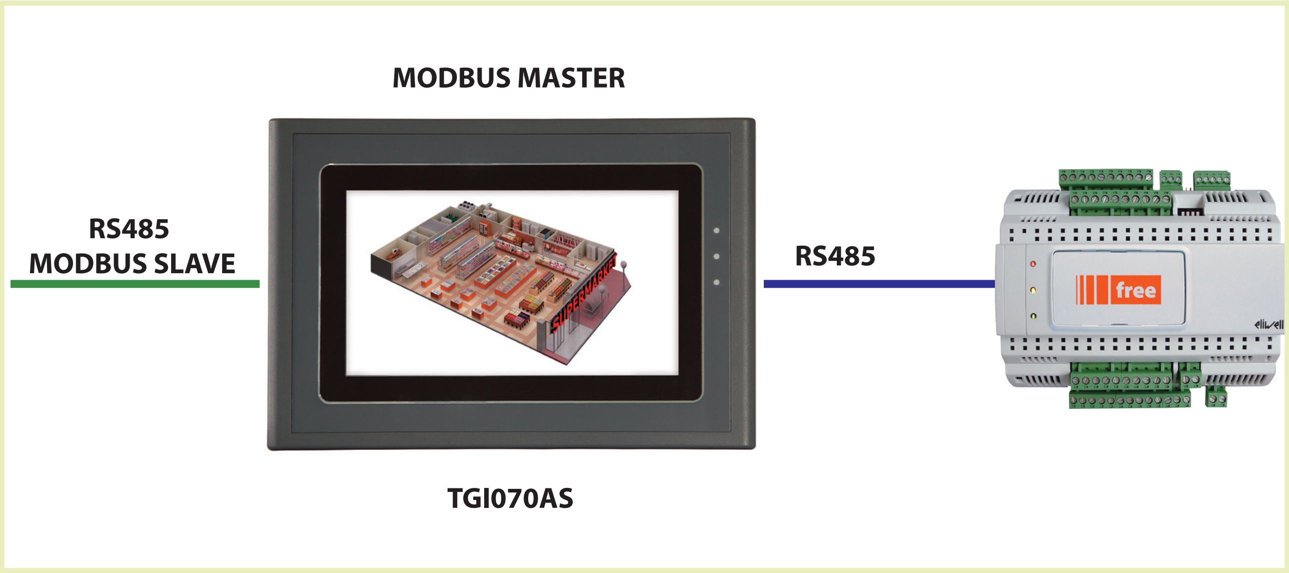
What (NETWORK):
Share variables (probes, status, alarms);
Set basic commands (ON/OFF, …).
What (SUPERVISOR):
Share variables (probes, status, alarms);
Set basic commands (ON/OFF, …);
R/W Controller Parameter and Variables, numeric and strings (Bridge);
Variables Logging.

Object/Function used

- TEXT;
- Static Picture;
- Bit Lamp;
- GIF display;
- Screen Button (also with Macro);
- Functional Button;
- Numeric Display;
- Numeric Entry (also with Macro);
- Ascii Character Entry (with Macro);
- Timer;
- Historical Trend;
- Alarm Control.

Other

- Alarm Log;
- Setting of Language by functional button;
- On/Off Buzzer on the Touch by functional button;
- Data Transport;
- Macro.



FIELD RS485

NETWORK Ethernet

SUPERVISOR RS485/Ethernet

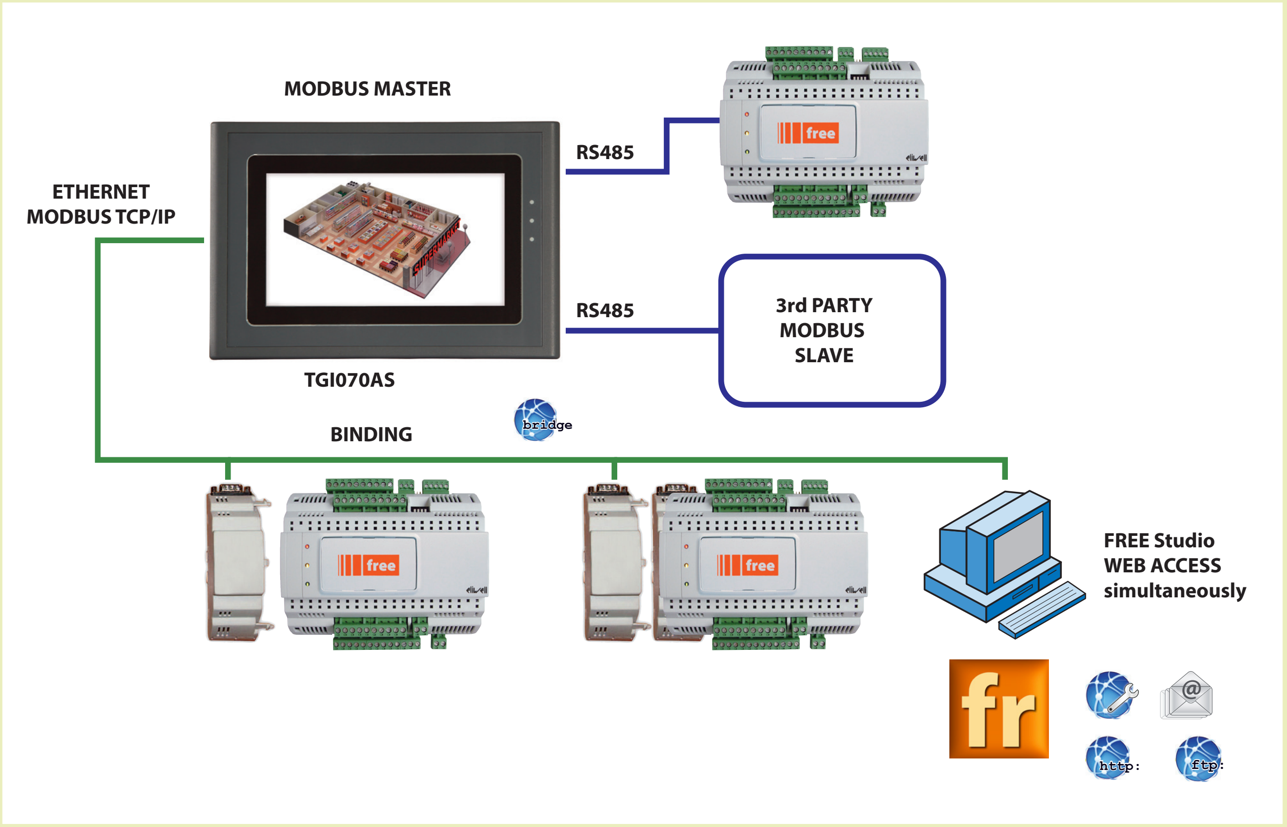
Connection
RS485 in ModBus RTU
Controller example
FREE Evolution

USE CASE FREE EVOLUTION (FILE: FREE EVOLUTION.zip)

2) FREE EVOLUTION on SK-070AS Touch Screen

What (NETWORK):
Share variables (probes, status, alarms);
Set basic commands (ON/OFF, …).

What (SUPERVISOR):
Share variables (probes, status, alarms);
Set basic commands (ON/OFF, …);
Variables, numeric and strings (Bridge);
Variables Logging.



FIELD RS485
NETWORK Ethernet
SUPERVISOR RS485/Ethernet

Connection
RS485 in ModBus RTU
ETHERNET
Controller example
FREE Evolution + EVS Plugin

APPENDIX - TIPS

FREE Family Modbus Address:
For work with free family at the modbus address must be subtract 1.

Work around BIT BUTTON
To use BB to write, the Boolean value must be convert in Integer with macro