BRIEF DESCRIPTION

RBG LEONIS
3.5 MASTER-SLAVE RS485 (3,5“ IPS-TOUCH)



EAP Electric GmbH A-2460 Bruck/Leitha Florianistraße 4 Tel +43/2162/67910 Fax +43/2162/67910/10
E-mail office@eap-electric.at Web www.eap-electric.at

BRIEF DESCRIPTION

Leonis3.5 is a Modbus RTU master and slave room device with temperature and humidity sensors, optional CO2 sensor, 2*RS485 ports (master and slave), USB device port and 3.5" touch screen. Modbus registers mapping with description can be found in Leonis3.5_registermapping.xlsx document.
There can be the following optional I/O: 2*DI, 1*PT1000 or 1*0-10V input, 2*OC or 2*0-10V output.
Leonis3.5 also acts as a configurable regulator and can be used for different regulation applications (temperature regulation, light control, jalousie control, fan coil regulator, etc).
Leonis3.5 configurator PC tool can be used for creating configurations for Leonis3.5 device. User can add widgets to screen, configure device settings and define device regulation behavior. Each configuration includes common device settings, screens / widgets and regulator logic. Configuration is stored in *.lmcfg file and icons in *.bfs file.
Regulator logic can be created in a PC tool with visual programming by adding and connecting basic blocks. Also Lua language scripting is supported for custom blocks behavior creation.
The PC tool is able to load configuration to the device via slave RS485 port (with USB-RS485 converter) or USB port (virtual COM port). USB port is much faster and there also slave port parameter can be changed.

TEXT WIDGETS

To display some value or text on the screen Text widgets should be used.
Important parameter is User Variable ID. User Variable allows linking Text widget to one of Modbus holding registers from special range (HR0..HR99). Registers from this range are called user variables. Change of linked register value will cause change of Text widget value on the screen (exact behavior depends from type of Text widget). Availability of User Variable ID parameter depends on Text type. Some Text types are intended to display internal measured values, for example temperature, humidity. User Variable ID parameter is unavailable for them.
Text widget has a text type parameter that defines its behavior. E.g. UserVar HR value type allows to display value from one of the user variables using predefined or custom formatting (Format / Custom format string parameters). Text before / Text after parameters can be used to add some text before / after value. Data format parameter defines internal interpretation of value, e.g. signed 16-bit or unsigned 16-bit. Divider parameter allows value scaling by dividing it to 1 / 10 / 100 / 1000.

ICONS WIDGETS

To display some icon (picture) on the screen an Icon widget should be used. Like Text widgets, Icons also have type parameter, which defines the behavior of the icon. For example, it can be a Fixed or Indexed icon.
Button, slider and switch widgets
Such widgets can change the assigned user variable on widget touch (exact behavior depends from type of widget). Button widget supports Virtual Button Mode, in this mode button itself is not visible, so it can be placed over some other widget like Text or Icon to achieve some reaction on press, e.g. change string / picture on each press for indexed type Text or Icon widget.
Screens
There is 1 main screen and up to 19 additional (auxiliary) screens. So it is possible to have overall 20 screens. To add or delete additional screens, the Add Aux Screen or Delete Aux Screen button from the main toolbar should be used accordingly. Switching screens can be performed by changing the last user variable (User Variable 100, HR99) via Modbus or two Button widgets (go to previous / next screen) assigned to this variable configured with increment/decrement button type. Also touch gestures (horizontal swipes) are supported for changing screens.
There is a possibility to copy an already created widgets to another screen. Steps for screen copy:
1. Right click on source screen -> Copy Screen.
2. Select the destination screen tab (press Add Aux Screen button to create a new one if needed).
3. Right click on destination screen -> Paste Screen.
It is also possible to copy / paste a single or group of widgets using the right-click popup menu.

DEVICE TAB

There are a lot of device settings available for configuring on Device tab, like Active / Standby brightness, Button widgets auto increment settings, RS-485 Master and Slave ports serial settings and others. Slave RS-485 serial settings will be applied by device only if connection is done via USB.

TEXTS TAB

User can store up to 40 predefined strings for each screen. Each string max length is 24 chars. Such strings can be used only for Indexed text type of Text widgets. With Indexed text type it is possible to assign predefined strings to a special set of string indexes (up to 10) to be able to select an active string from a set with Modbus RTU requests or other widgets like Buttons.

ICONS TAB

Up to 255 icons can be stored for whole device configuration. Max possible icon size: 320x480. Max possible size of all icons (*.bfs file size): 6 MB (only uncompressed icons are stored, auto conversion to uncompressed format is always done for all icons loaded by user).
Transparent icons are supported: user can load png pictures with transparency (alpha channel) and it will be auto converted into transparency format supported by device (such icons transparent areas will be filled with bright green color on small previews at Icons tab).

USER VARIABLES TAB

Modbus registers from special range (HR0..HR99) are called user variables. These registers can be linked to widgets using the User Variable ID parameter. User variables allow access to UI widgets via Modbus RTU protocol. Also with user variables it is possible to define reaction on widgets events, for example, change target temperature on the screen with a slider. To achieve this, the same user variable should be assigned for both Slider and Text widget. At the same time it is possible to perform remote read of target temperature value using Modbus RTU read requests of corresponding user variable holding register.
Each user variable can be configured as volatile or permanent. Unlike volatile, permanent mode preserves value during Leonis3.5 device power off periods. So for a target temperature example, it can be useful to set permanent mode for the correspondent user variable to avoid loss of selected temperature in case of power off/on cycles. In case of volatile mode, the user variable will be set to default value after each power on. Default values can be assigned to each user variable on the User Variables tab.
It is also possible to protect user variable value change with password. This function can be useful, for example, when a user variable defines the mode of operation of some remote device and only authorized staff can change this mode. With password protection enabled, password enter screen will appear when the user will try to change a variable using a button or slider. In case of successful password enter, user variable change will be allowed during time defined in Password valid time device parameter with prolongation on each new screen touch. To set a password, the engineering menu Password parameter from the main device settings tab should be used (0 – protection off).
Last user variable (HR99) has a special purpose: get / set active screen (0 - first, 1 - second ...).
There is an important feature regarding Modbus RTU write requests to user variables linked with button / slider / switch. After the user variable changes by touch, Modbus write to corresponding register will be ignored for 3 seconds. This is needed for easy several Leonis3.5 devices synchronization while working with PLC and controlling the same thing, e.g. for dimming same lamp. While user change lamp brightness with slider on one Leonis3.5, PLC read brightness value from all devices, control lamp with actual value and write this value to all devices including user one. 3 seconds write ignore period allows user to comfortably select needed value without overwriting with older value from PLC.

LOGIC SCHEME

It is possible to create up to 30 logic schemes using the PC tool. Each scheme can include different blocks and connections between them. All schemes are stored together with UI (user interface) configuration in *.lmcfg file. Using right-click popup menu it is possible to copy existing scheme and paste it into other empty scheme sheet. Scheme name can be changed in popup menu. Also each scheme can be saved / loaded to / from *.lmsch file separately from whole logic configuration (this can be useful to create typical schemes with some finished function and load them to different projects).
Two approaches can be used for logic scheme creating: offline creation or online creation in interactive design mode. In offline mode device logic should be firstly created on PC and then loaded to device together with UI configuration. In online mode it is possible to create logic regulation configuration in real time: add/delete blocks, connect/disconnect wires or change blocks parameters actions will be immediately applied to the device. Also blocks I/O values will be displayed, so logic configuration debug can be performed. Slave RS485 is used for online mode. After creation is finished it is possible to save the logic scheme permanently to the device. After interactive design mode, in offline mode, if some change will be done with logic scheme (e.g. change position of block) PC tool will not be able to start online mode again because local logic scheme differs from device logic scheme. So for starting online mode, local PC tool config should be exactly the same as device config (or both empty).

SIMULATION MODE

Simulation mode can be helpful for checking configuration behavior without loading to device. To start simulation, a “Simulate” button should be pressed, separate simulation windows will be shown. Full device behavior simulation is supported including UI and logic. It is possible to view / change user variables during simulation. Regulation logic blocks I/O values displayed at the Logic Scheme tab of the configurator main window. Moreover, it is possible to keep the simulation window open and continue to create UI and regulation logic, all changes will be applied to the simulation window. Also user can define internal sensor values (Temperature, Humidity, CO2) and local device I/O.

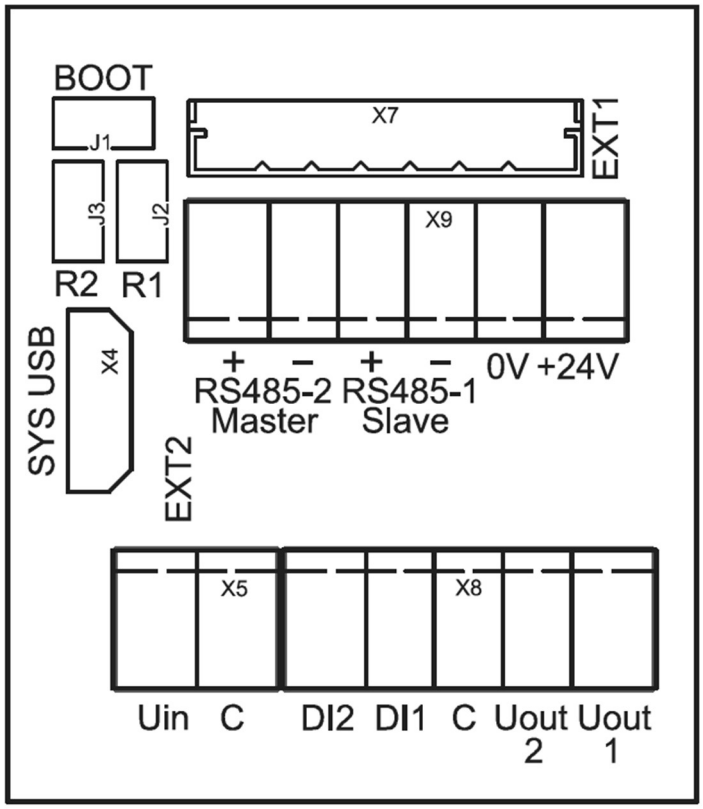
LEONIS3.5 SETTINGS SCREENS

Commons settings screen can be used for configure active / standby brightness and T measured correction directly on Leonis3.5 device. To enter common settings, 3 vertical swipes in the top screen area should be done.
Modbus slave port settings screen is used for configuring Modbus RTU slave port parameters (address, parity, baudrate). This screen can be opened with left to right horizontal swipe in the bottom area of the common settings screen.
It is possible to protect change of Modbus slave port settings with password. Password can be defined in the settings tab of the configurator. In case of active engineering menu password (password value different from 0), password enter screen will appear on change try.

FIRMWARE UPDATE AND CHECKING SOFTWARE AND CONFIGURATION VERSION

Remote device FW update can be performed using the firmware update window (Settings tab). Update is possible via RS485 or USB connection. For the firmware update the appropriate BIN file must be selected and then Update of the internal memory must be pressed.
Also it is possible to check connection to the device by pressing the Check HW button. In case of a successful connection, Leonis3.5 software version (SW), hardware version (HW) and file system version (FS) will be displayed.
To update several devices at the same time via RS485, the broadcast mode can be set. Then "Check HW" is mandatory. If broadcast mode is used, the configurator will scan 1..247 address range for devices. If at least one device is found, Found device button will become active. By pressing it, the table with found devices will be shown. It can be useful to check SW versions of found devices to ensure that broadcast FW update was successful. If some devices have not been updated, they should be updated individually in the addressed mode (without broadcast). Also after broadcast update of device configurations, found FS versions information can help to check if all configurations were successfully loaded.

WIRING PLAN:



R1 IS TERMINATION FOR SLAVE RS485
R2 FOR MASTER RS485
(BOOT FOR SOFTWARE INCLUSIVE BOOTLOADER, USUALLY NOT USED)

TERMINALS: PLUG-IN TERMINALS WITH PUSH-IN CONNECTION UP TO 1.5MM²
WIRES: SOLID CONDUCTORS OR FINE-STRANDED CONDUCTORS (FLEXIBLE CONDUCTORS) UP TO 1.5MM² WITHOUT FERRULES INSULATION STRIPPING > 11MM

MOUNTING: THE LEONIS IS DESIGNED FOR MOUNTING ON A FLUSH-MOUNTED BOX AND IS CARRIED OUT USING MOUNTING PLATE SCREWS AND CONNECTION PLUGS WITH PLUG-IN DOUBLE PUSH-IN TERMINALS (PRE-INSTALLATION POSSIBLE), WHICH ARE INCLUDED IN THE SCOPE OF DELIVERY.

