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App note 0030

Local bus

Document revision	Release date	For version		
		Hardware	Firmware	Software ENVIS
1.0	15.07.2024	... LB	$\geq$ 4.0.0	$\geq$ 2.0.0

Contents

1 About

Local bus is proprietary master-slaves bus and it is for connecting measuring master device with extension slave modules. Bus contain signals for communication, synchronisation and powering slave devices.

Master can be any KMB device with local bus interface (LB in device type name) and any other communication interface (USB, RS485, Ethernet). It can be for example SMY, EMU or BCPM device. There can be only one master device on the bus with up to 5 slave devices. Slave device is extension module (like EMI device), which uses bus for communication with master device and it is also powered through the bus.

Every device on the bus has 4 indication LEDs: PWR, RX, TX a SYN.

- PWR (power) indicates power on of device.
- RX (receive) and TX (transmit) indicates communication – TX for sending data into the bus and RX for receiving data from the bus.
- SYN indicates synchronisation puls.

Bus has 6 contacts (listed in table below) and it uses 8 or 6 pin connectors – RJ45 (8P8C) or Phoenix Contact DFMC 1,5/ 3-ST-3,5-LR. For connecting devices is recommended to use 4-pair UTP CAT5E cable. Pinout is in the picture below. If needed, both ends of cable can have same connectors, pinouts of connectors are still the same.

Shortcut	**Meaning**	***Note***
X1	Power	*doubled*
X2	Power	*doubled*
4A	Data	
4B	Data	
SA	Synchronisation	
SB	Synchronisation	

Table 1: Pin meaning

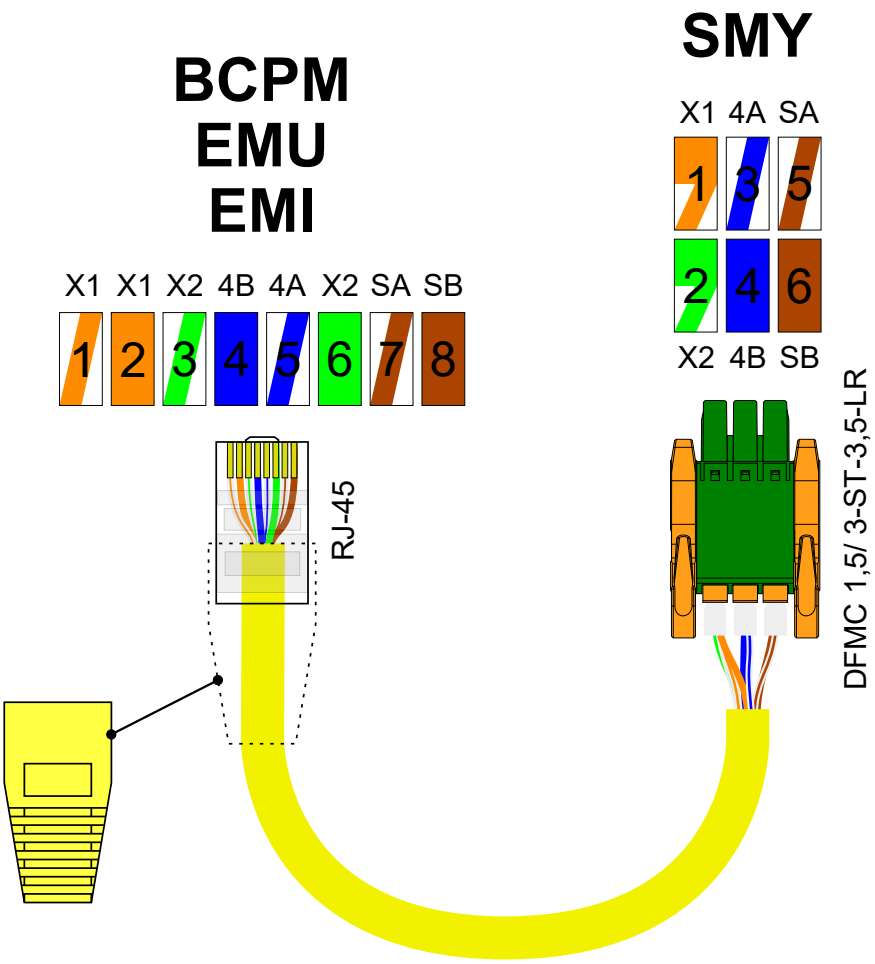

Figure 1: Pinout

Despite the use of RJ45 connector, local bus is not compatible with Ethernet interface! Don't connect port of local bus marked "Local Bus" with any network device like switch, router. It could damage devices.

2 Putting into operation

2.1 Connection

For connection, it is required to have devices (1× master and up to 5× slave) mounted. Connection starts with suitable cable from master to the first slave device. For connecting other slave devices, connect it to previous (already connected) slave device.

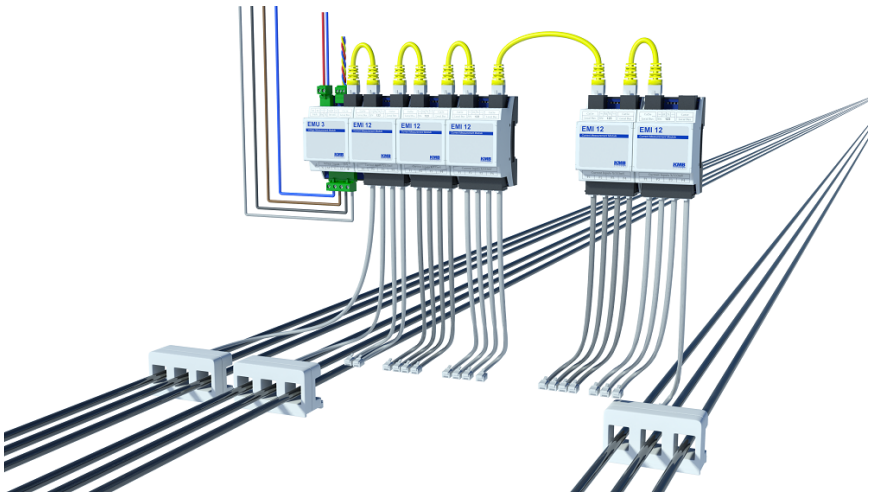

Figure 2: Example of connection devices using bus

After power on master device, all slave devices power on also. That is indicated with turned on PWR LED. After automatic identification should every device also has blinking RX, TX and SYNC LEDs. If master has no slave device connected, master has only turned on PWR and blinking TX and SYNC LED. RX LED is turned off – no data from bus are received.

2.2 Settings

All settings can be done with *ENVIS.Daq* program. After connect to master device via suitable interface (USB, RS485, Ethernet ...), open *Configs* window, *Local Bus* tab. There is necessary to set each slave device.

Main identifier of slave devices is their serial number. Found devices are shown at bottom of window.

On the left side *Configured Slaves*, choose the first device by clicking on *(D1)* and on the right side in *Parameters* section, fill serial number of slave device. Found devices and their serial numbers are listed or you can fill serial number according to device nameplate. To make future records more readable, fill also name, for example object name. Then enable on the left side used feeders *(F1-F4)* and set their Ratio, Multiplier and Connection according to used current transformers. You can fill name also here, for example measured device.

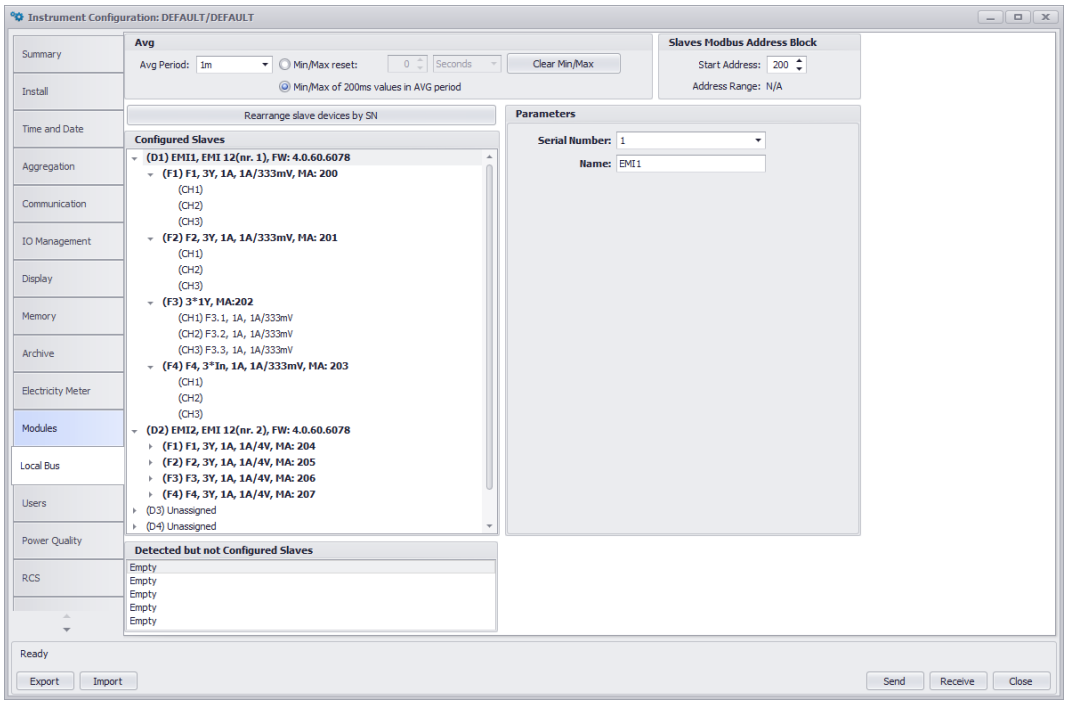

Figure 3: Configured local bus

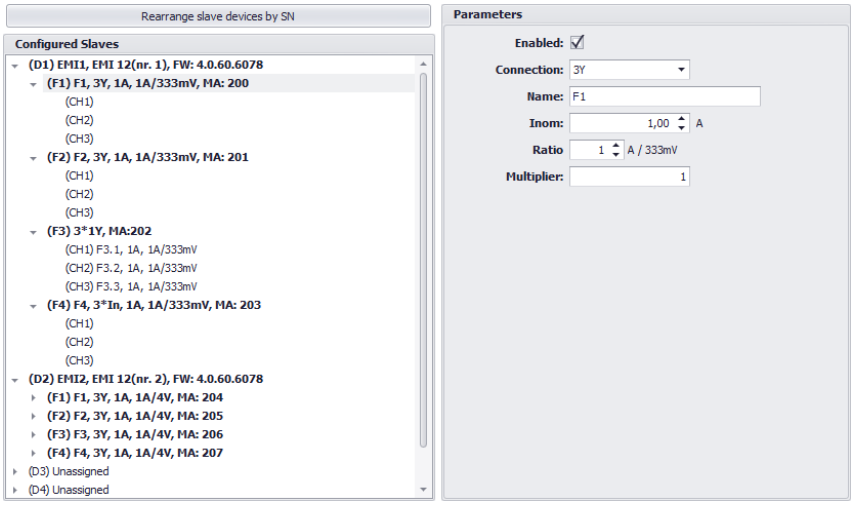

Figure 4: Feeder settings

2.3 Problem fixing

After local bus set up, check slave measuring via *ENVIS.Daq* program, in *Act Data* window. Check measuring values corresponding assumption – current value on *EMI Act* tab or on the top, select slave feeder instead of *Master* and check on *Waves* tab current oscillogram.

If devices don't communicate with each other (device LEDs are not blinking, measured values are not good or measured, current oscillogram is missing ...), check device LEDs.

- PWR LED is turned on on every device.
  - If not, there is power issue. Check cable, connectors and connection.
    - If more than one device is not working, check cable between the last working (or master) and first not working device.
- SYNC LED is blinking on every device.
  - If it is not blinking, check cable, connectors and connections.
    - Check cable between the last working (or master) and first not working device.
- RX and TX are blinking on every device.
  - If RX LED isn't blinking on slave device, check proper connections, cables and connectors.
  - If TX LED isn't blinking on slave device, slave doesn't understand to master.
    - Check via *ENVIS.Daq* program all slave devices settings. Serial numbers of slave devices is the most important parameter of them.
    - Check via *ENVIS.Daq* program FW version of master and slave devices and their compatibility (for example same version) or update to the newest version master and slave devices. Slave devices should be recognized and listed in *ENVIS.Daq* program, also with their FW version.
  - If RX LED isn't blinking on master device, check cable, connectors and connections.

In case all above is checked and slave devices still don't measure right, there is settings problem – enabled feeders, connection and ratio settings.

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