



DESIGO™

## EMU communication interface

## NIREM V1.1

An RS-OPEN standard application

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**The EMU communication interface NIREM allows the integration of up to twelve EMU30.x7 energy meters via RS-OPEN into the Landis & Staefa INTEGRAL MS2000 and INTEGRAL TS1500 / INTEGRAL MS1000 management systems.**

### Use

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- Interface to integrate EMU30.x7 power and energy meters into the Landis & Staefa INTEGRAL MS2000 system (via NICO and NCRS).
- Interface to integrate EMU30.x7 power and energy meters into the Landis & Staefa INTEGRAL TS1500 system (via NITEL).

### Functions

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- Automatic scan of up to twelve EMU meters
  - The NIREM periodically reads the data from the EMU devices and updates its internal database.
- Reads the following values from each device:
  - Number (address) of the connected device
  - Power
  - Energy 1 (energy tariff 1)
  - Energy 2 (energy tariff 2)
  - Voltage (L1, L2, L3)

- Current (L1, L2, L3)
- $\cos \varphi$  (L1, L2, L3)
- Frequency
- Signalling of communication errors
  - In case of an error in the communication to the EMU devices, the NIREM automatically sends an alarm to the management station.
- The NIREM can easily be configured for a different number of connected devices and different EMU addresses.

## Connection

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The EMU devices are connected to the COM1/RS485 port of the NIREM as shown under "Connection diagrams". The easiest way to do this is to use a NARB. Connect the NIREM by ribbon cable to a NARB and from there connect the TX and RX signals to the RJ plug of the EMU meters.

### Caution

The EMU meters bus must be powered externally as specified in the EMU documentation.

In some early EMU 30.x7 devices, there is a mistake on the printed circuit board. To enable communication with these devices, two diodes must be removed from the EMU 30.x7 printed circuit board. Please contact EMU or our Support department for detailed information.

## Engineering notes

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### Note

The NIREM is treated like an RS module in terms of overall engineering. Therefore the related documents (see "Literature") should be studied before reading the following section.

Unlike a standard RS module, there is no download of a SAPIM table to the NIREM. There is only one configuration option in the NIREM application. The respective EMU device addresses can be set via US01 to US12. These addresses must be in the range 0 to 9999. The default for these registers is zero, which means that there will be no communication with the associated EMU meter. A value not equal to zero means that the EMU meter with this address will be scanned.

In the NIREM all the information from the EMU meters is mapped permanently to the internal data points. Up to twelve meters can be connected to one NIREM. 14 consecutive SAPIM analogue registers are reserved for each EMU meter. The values received from EMU meters 1 to 6 will be converted into the UI SAPIM registers and the values received from EMU meters 7 to 12 into UZ SAPIM registers. There is no difference in the handling of these two types of registers, either in the RS-OPEN or in the NICO-N or NITEL.

## Mapping

The information from the EMU meters is mapped to the analogue registers as follows:

Register name / number	Usage
UI n or UZ n	Address of the connected device
UI n+1 or UZ n+1	Power
UI n+2 or UZ n+2	Energy 1 (energy tariff 1)
UI n+3 or UZ n+3	Energy 2 (energy tariff 2)
UI n+4 or UZ n+4	Voltage L1
UI n+5 or UZ n+5	Voltage L2
UI n+6 or UZ n+6	Voltage L3
UI n+7 or UZ n+7	Current L1
UI n+8 or UZ n+8	Current L2
UI n+9 or UZ n+9	Current L3
UI n+10 or UZ n+10	cos $\phi$ L1
UI n+11 or UZ n+11	cos $\phi$ L2
UI n+12 or UZ n+12	cos $\phi$ L3
UI n+13 or UZ n+13	Frequency

Communication failures of the EMU meters are mapped to the DX registers as follows:

Register name / number	Usage
DX11	Device 1 communication failure
DX12	Device 2 communication failure
DX13	Device 3 communication failure
DX14	Device 4 communication failure
DX15	Device 5 communication failure
DX16	Device 6 communication failure
DX21	Device 7 communication failure
DX22	Device 8 communication failure
DX23	Device 9 communication failure
DX24	Device 10 communication failure
DX25	Device 11 communication failure
DX26	Device 12 communication failure

Registers US01 to US12 are used as follows for the device address:

Register name / number	Usage
US01	Address Device 1
US02	Address Device 2
US03	Address Device 3
US04	Address Device 4
US05	Address Device 5
US06	Address Device 6
US07	Address Device 7
US08	Address Device 8
US09	Address Device 9
US010	Address Device 10
US011	Address Device 11
US012	Address Device 12

## Data point types

The following data point types are defined in the RS-OPEN:

Point type	Total number of points	Description
AI	84	Values of modules 1 to 6
UZ	84	Values of modules 7 to 12
US	12	0 → no scanning 1 ... 9999 → EMU device with this address will be scanned
UP	1	Baud rate
DX	12	Alarm of modules 1 to 12

## Failure behaviour

In case of a communication error between the NIREM and an EMU meter, all the associated values are left unchanged except the data point with the returned device address. This point is set to zero until the next successful communication.

## Communication

The protocol used to communicate with the EMU meters is compatible with IEC standard IEC 1107 Mode C. The communication with a meter is initiated at 300 baud, and a baud rate of 1200 baud for the data transfer.

## References

### Literature

1. NICO Interface Protocol Description V 2.00
2. INTEGRAL MS2000 V2, Software manual, staefa access [E23B]
3. INTEGRAL MS2000 V2, Product catalogue and installation guide [E31]
4. INTEGRAL MS1000, TS1500 Technical manual [NT21]
5. INTEGRAL MS1000 and TS1500  
NITEL communication interface data sheet [NT21-03.10]

## Technical data

Power supply	Operating voltage	AC 24 V
	– Voltage tolerance	–10/ + 15 %
	Frequency	50 Hz or 60 Hz
Hardware	Power consumption	7 VA (max.)
	Standard NITEL hardware	<ul style="list-style-type: none"> <li>- Watchdog monitored</li> <li>- Battery backed-up RAM (&gt; 3 years)</li> <li>- Complies with IEC801-1...6, IEC 0871, NAMUR NE21, L&amp;S standard EEK-010 Class 3, and is CE marked</li> </ul>
	Connection	
to EMU meters		<ul style="list-style-type: none"> <li>- Standard RS485 port</li> <li>- Baud rate: 300/1200 bits/s</li> <li>- Protocol as defined in IEC 1107 Mode C</li> <li>- Max. length for the link: 2400m</li> </ul>
	to INTEGRAL AS1000	<ul style="list-style-type: none"> <li>- Standard RS485 port for INTEGRAL AS100</li> <li>- Fully compatible with RS bus protocol</li> </ul>
EMU devices	Supported type	Power and energy meters, type EMU 30.X7
	Maximal number of devices per NIREM	12 devices

Standards	EMU address range	1...9999
	CE conformity	Meets the requirements for CE marking in accordance with EU Directive:
	Electromagnetic compatibility	89 / 336 / EEC

**Note** For technical data and dimensions common to all RS-OPEN modules, refer to data sheet "NITEL communication interface" [5].

**Connection diagrams**

TS1500

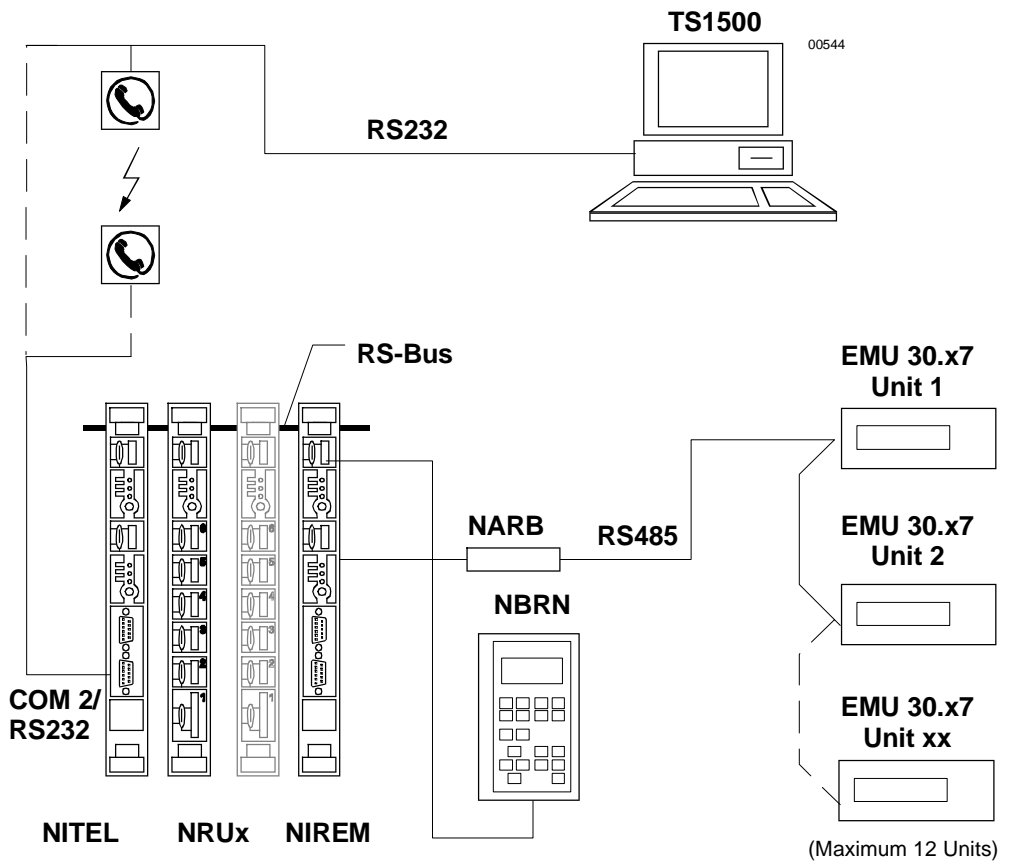


Figure 1

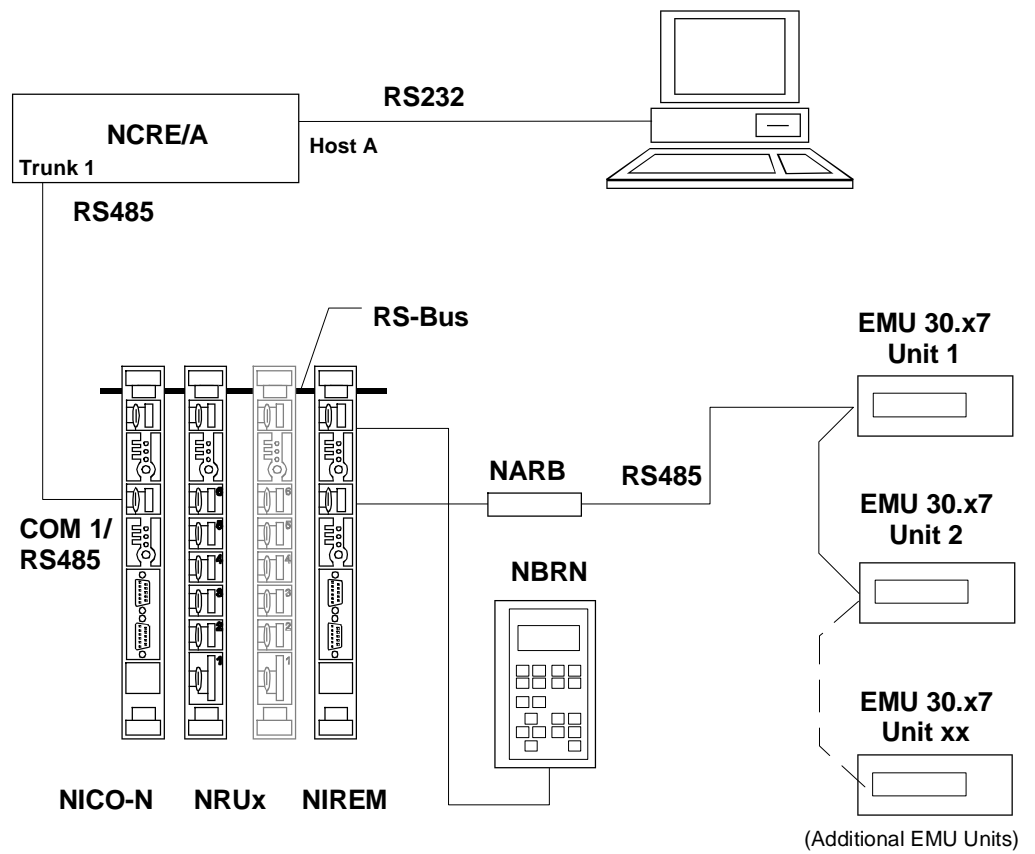


Figure 2

**Template**

A template is available on the Partner Integration intranet page for the engineering of the management station and the NITEL or NICO-N.