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INTRODUCTION

This data sheet is an appendix to the general RTU870 data sheet.

It covers RTU870 with a additional mirrored IEC870-5-101 Slave driver on the RS232 Meter port (COM3 which is placed on the 24IO board only).

The mirrored Slave driver is implemented as a total mirror of the primary port. The Driver do only support direct serial commuincation. No modem commuincations is available.

The mirrored Slave driver do monitor and control the same data queues as the primary port.

A RTU870 with this driver can be configured with the IOTOOL870 configuration tool. The physical RS232 data parameters used for the mirrored port can be setup in the config table in the IOTOOL870. See details in configuration section.

The IEC870-5-101 Master communicating with the RTU870 shall manage the communication as there is no control of priorities of the two 101 Slave intefaces in the RTU870. If active dial-up is enabled for the primary port and priorities is required, a special extention to the B-CON program must be added.
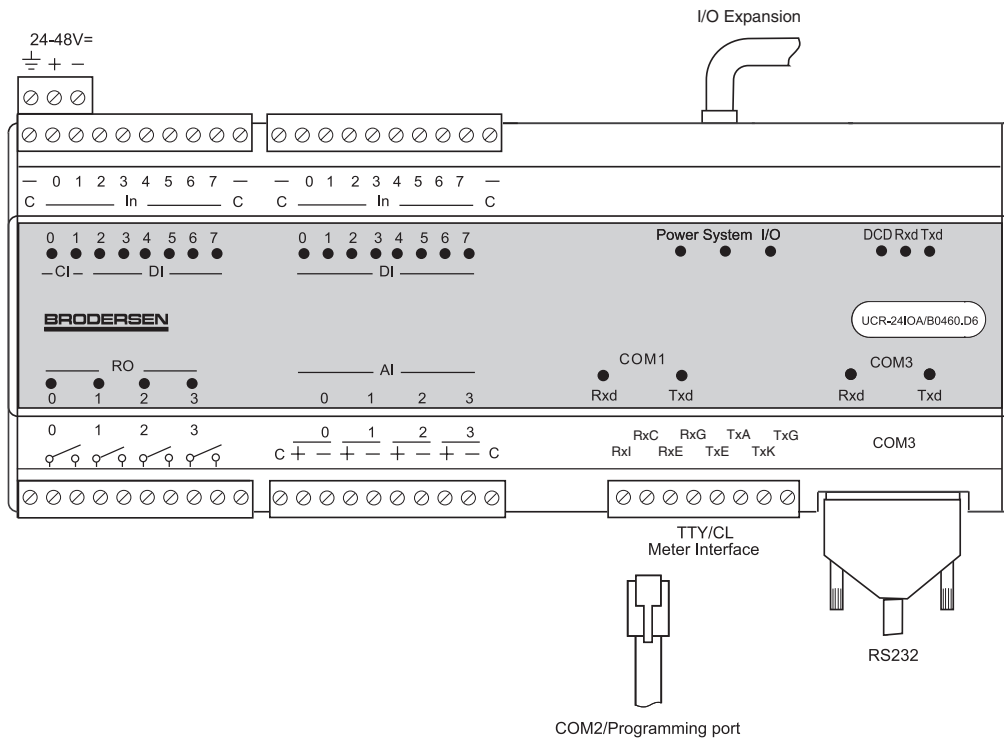
VERSIONS/ORDERING CODES

UCR-24IOA/4xxx

Type
UCR   UCR
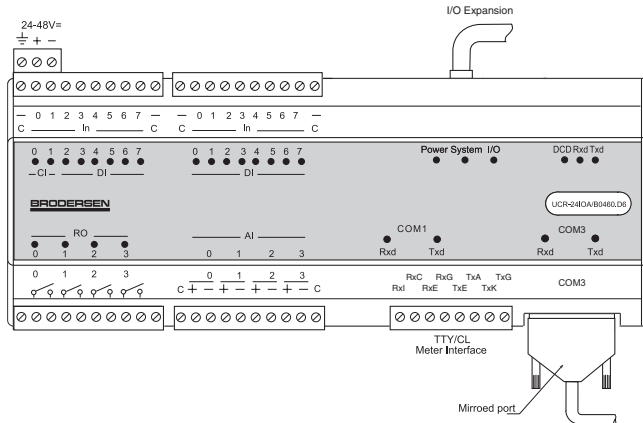
Options
Mirror 101 slave   4
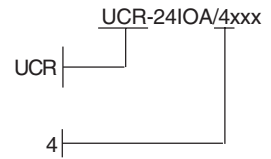
RTU870

BRODERSEN

Compact utility outstation / EN/IEC60870-5-101 slave
RTU870 with additional mirrored 101 Slave driver

CONTENT

TECHNICAL DESCRIPTION

Wiring diagram
UCR-24IOA/4xxxxx

Serial RS232 COM3 interface on the 24IO board.

RS232 port (9 pole sub-D)

Pin no	Signal	Description/Remarks
1	DCD	Data carrier detect (in)
2	RX	Receive data (in)
3	TX	Transmit data (out)
4	DTR	Data terminal ready (out)
5	SG	Signal ground
6	DSR	Data set ready (in)
7	RTS	Request to send (out)
8	CTS	Clear to send (in)
9	RI	Ringing indicator (in)

The RS232 port (9 pole sub-D) is equipped with all hardware handshake signals (DCD, DTR, DSR, RTS, CTS, RI).

The use of handshake, leading and trailing delays are user configurable via the PC utility menu.
The handshake functions are as follows.

RTS Leading
The RTS Leading define the delay time from activating RTS to transmitting the first character.
The RTS Leading value is configurable in the range 0..500 of 10ms units. Ie. up to 5000 ms.

RTS Trailing
The RTS Trailing define the delay time from the last character is transmitted to RTS is deactivated.
The RTS Trailing value is configurable in the range 0..50 of 10 ms units. Ie. up to 500 ms.

CODE SWITCH/ADDRESS SELECTOR

The code switch of the RTU870 selects the common ASDU address according to IEC870-5-101 as a 8-bit binary (0-255). Additional two switches are free and can be used by the application program. All switches are readable from the application program.

The logical common ASDU address is defined as the sum of the binary value selected using switch 1-8 and the binary value of the logical address configured in the FLASH (default = 0).

Compact utility outstation / EN/IEC60870-5-101 slave
RTU870 with additional mirrored 101 Slave driver

CONFIGURATION

The RTU870 Configuration program is used to configure the RTU870. The configuration tool makes it possible to setup both hardware specific and protocol specific parameters. Refer to the RTU870 Configuration tool user guide for more info.

For experienced user, the IO Explorer can also be used. With this tool you may configure the RTU870 with additional control features, change many protocol specific parameters. High level programming skills required.

RTU870 Configuration fields
A number of configuration fields are provided. The field values are changed and downloaded into the RTU flash memory, using the RTU870 Configuration menu. The fields are used for values that are programmed once when setting up the module (e.g. baud rate).
The following fields are provided to control the RTU with the actual interfaces including the EN/IEC60870-5-101 slave port driver.

RTU870 configuration table

Property	Value	Unit
COM1 cfg IEC870-101		
Baud rate	9600	
Use E5 resp.	Ack/No data	
Resp. Delay	1	of 10 msec
RTS Leading	5	of 10 msec
RTS Trailing	1	of 10 msec
Retry count	3	
Max comm cnt	256	
Subs to try	1	
Redial delay	90	Seconds
Tel. no.	(Table)	
Modem init.	(Table)	
PIN Code	(Table)	
Modem Reinit	37	Minutes
Dial back	Disabled	
User	0	
Date/Time	(Clock)	
Boot delay	2	Seconds
S0 Cnt Type	Accumu.	
S0 Interval	3	Minutes
Analog Range	0...20 mA	
COM3 cfg IEC870-101 (specific for the mirrored 101 port)		
Baud rate	9600	
Use E5 resp.	Ack/No data	
Resp. Delay	1	of 10 msec
RTS Leading	5	of 10 msec
RTS Trailing	1	of 10 msec

COM1 cfg.
This is the header for the configuration of IEC870-5-101 parameters

Baud rate
Define the baud rate for the serial port, with 101 slave mirrored driver.

Use E5 resp
Option for using E5 response. It is possible to select; Not used, used as acknowledge and used as acknowledge and no data.

Resp. Delay
Defines the response delay in times of 10ms.

RTS Leading
Defines the delay from the RTU is activating the RTS to the transmission of the first character.

RTS Trailing
Defines the delay from the RTU is transmitting the last character to de-activating RTS.

Retry count
Defines the number of retries which should be made to the same telephone number before giving up or continuing to the next number, if the call is not successful. Default value: 3, Range: 0 .. 10.

Max comm cnt.
Defines the number of times the input and output will be read and written before the module makes a hang-up. If Max Com Count=256 the PC is responsible for correct hang-up.
This option should normally not be changed.

Subs. to try.
Defines the number of subscribers to try after being through the number of retries on the first number in the list of phone numbers. If the value is set to 3, it will try number 1, 2 and 3 in the phone no list.
Default value: 1, Range 1-10.

Redial delay.
Defines the delay from an unsuccessful attempt to dial to a new attempt to establish connection.
Default value: 90 sec, Range: 2-120 sec.

Tel. no.
The maximum number of telephone numbers stored in RTU is 30, the maximum length is 20 characters. The telephone numbers can although include some special characters to control the dialling function of the modem.

Modem init.
The modem initialisation string has a maximum length of 60 characters. This string contains the configuration data for the connected modem. It will be sent cyclic to the modem and every time a connection is established by the RTU. Default value: ATV0E0&C1S0

PIN code.
If GSM modem is used and PIN code is required for the SIM card, the PIN code must be entered here. Be careful to enter the right PIN code – if not, the three normal attempts will quickly be used up and a PUK code is required to re-open the SIM card again. Use a normal mobile telephone to change PIN code parameters and enter PUK codes.
Default: blank

Modem Reinit.
Defined the time in minutes between cyclic re-initialisation of the modem. If the modem of some reason is reset and the required modem settings not has been save in the modem flash, the modem will start up with its default settings. With this option you can make sure that the modem is initialised periodically. Default value: 0 min, range 0-999min.

Dial back
Enable or disable the dial back function.

User
User defined value. Constant value can be used in B-CON application / IEC870

Date/Time
Real time clock adjustment. The actual time in the module can be monitored and adjusted either by entering the time or by copying the PC clock to the module.

Boot Delay
Ensure that master boot is not started until the I/O bus is fully up running. In case of several analogue I/O modules connected you may encrease this value in sec.

S0 Cnt Type
Define the counter type. Absolute values or acumulated values is possible.

S0 Interval
Define the length of the time between counter values is tranfered to the IEC870-5-101 queue. Values from 1min to 240min is posssible, however the selected value has to dividable into 1 day (24hours).

Analog Range
Select the analogue input range; 0-20mA or 4-20mA. Note that underflow alarm is only valid in range 4-20mA.

COM3 cfg IEC870-101
This is the header for the configuration of the mirrored 101 Slave port.

Baud rate
Define the baud rate for the serial port, with 101 slave mirrored driver.

Use E5 resp
Option for using E5 response. It is possible to select; Not used, used as acknowledge and used as acknowledge and no data.

Resp. Delay
Defines the response delay in times of 10ms.

RTS Leading
Defines the delay from the RTU is activating the RTS to the transmission of the first character.

RTS Trailing
Defines the delay from the RTU is transmitting the last character to de-activating RTS.