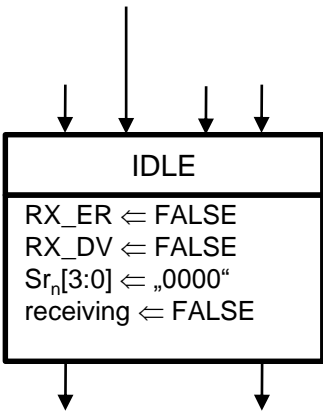# 10 Mb/s Single Twisted Pair Ethernet
## PCS Receive State Diagram

**Steffen Graber**

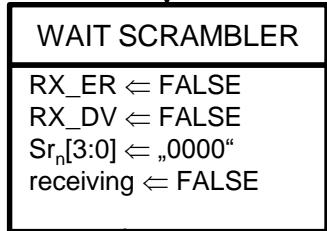**Pepperl+Fuchs**

# PCS Receive State Diagram

- An additional state ("WAIT SCRAMBLER") for descrambler synchronization is required for the state machine to wait until the descrambler is in sync before going into "IDLE" state:
  - Otherwise in case the descrambler is not synchronized, it is possible that the state machine hangs in "BAD DELIMITER" state until jabber is detected and the state machine is resetted.
  - Then the state machine is in "IDLE" state again, but not receiving valid idle data as the descrambler is not synchronized.
  - In this case the state machine jumps from the "IDLE" state into "BAD DELIMITER" state again without syncing the descrambler, thus ending up in an endless loop.

(pcs_reset = ON) +
[(receiving = FALSE) *
[(loc_rcvr_status = NOT_OK) +
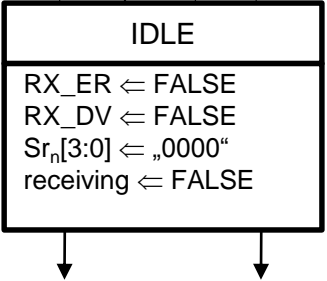(link_status = FAIL) +
(rcv_jab_detected = TRUE)]]

Add additional „WAIT SCRAMBLER" state in PCS receive state diagram.

(pcs_reset = ON) +
[(receiving = FALSE) *
[(loc_rcvr_status = NOT_OK) +
(link_status = FAIL) +
(rcv_jab_detected = TRUE)]]

**WAIT SCRAMBLER**

RX_ER $\Leftarrow$ FALSE
RX_DV $\Leftarrow$ FALSE
$Sr_n[3:0] \Leftarrow$ „0000"
receiving $\Leftarrow$ FALSE

RSTCD * (scr_status = OK)

**IDLE**

RX_ER $\Leftarrow$ FALSE
RX_DV $\Leftarrow$ FALSE
$Sr_n[3:0] \Leftarrow$ „0000"
receiving $\Leftarrow$ FALSE

**IDLE**

RX_ER $\Leftarrow$ FALSE
RX_DV $\Leftarrow$ FALSE
$Sr_n[3:0] \Leftarrow$ „0000"
receiving $\Leftarrow$ FALSE

# Thank You