

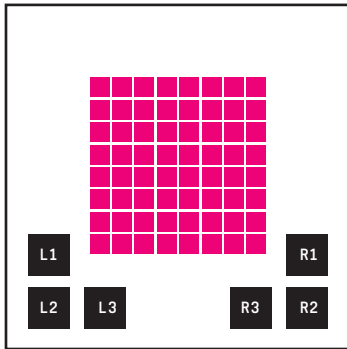
WORKSHEET A023

LOCAL COMMUNICATION II

When communicating between two Oxocards, the exchange of variables is of particular interest, as these can be further used in the respective program.

EXERCISE

Send and receive three variables with different color values (0-255) and display them. For example, the colors could be increased or decreased by pressing a button.



If, for example, you press L1, the red component should be increased by 25 and reduced by 25 for R1. The same for L2/R2 for green and L3/R3 for blue.

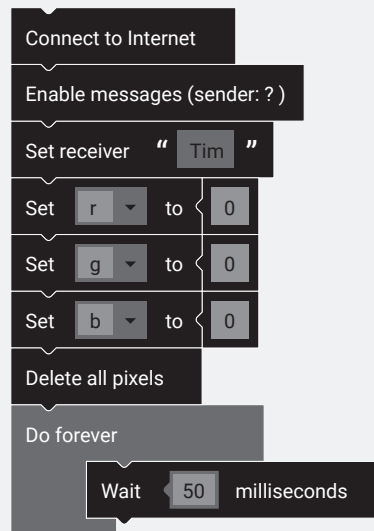
The name of your Oxocard is used as sender. You can change this name in the Blockly on the right, in section «My Oxocard».

As the recipient, you must specify the name of the card to which you want to send the message.

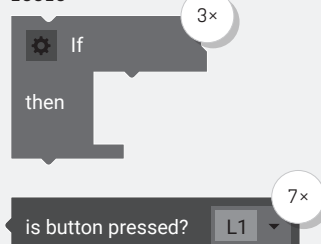
HINT

To avoid sending the same data all the time in the «Do forever» loop, you should only send data when a button has been pressed or data has been changed.

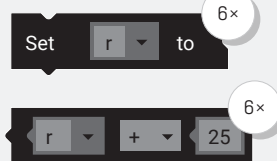
TEMPLATE



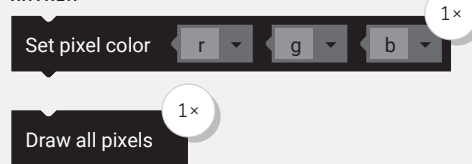
LOGIC



VARIABLES



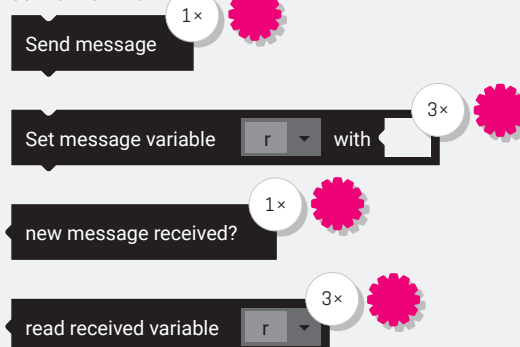
MATRIX



TIME



COMMUNICATION



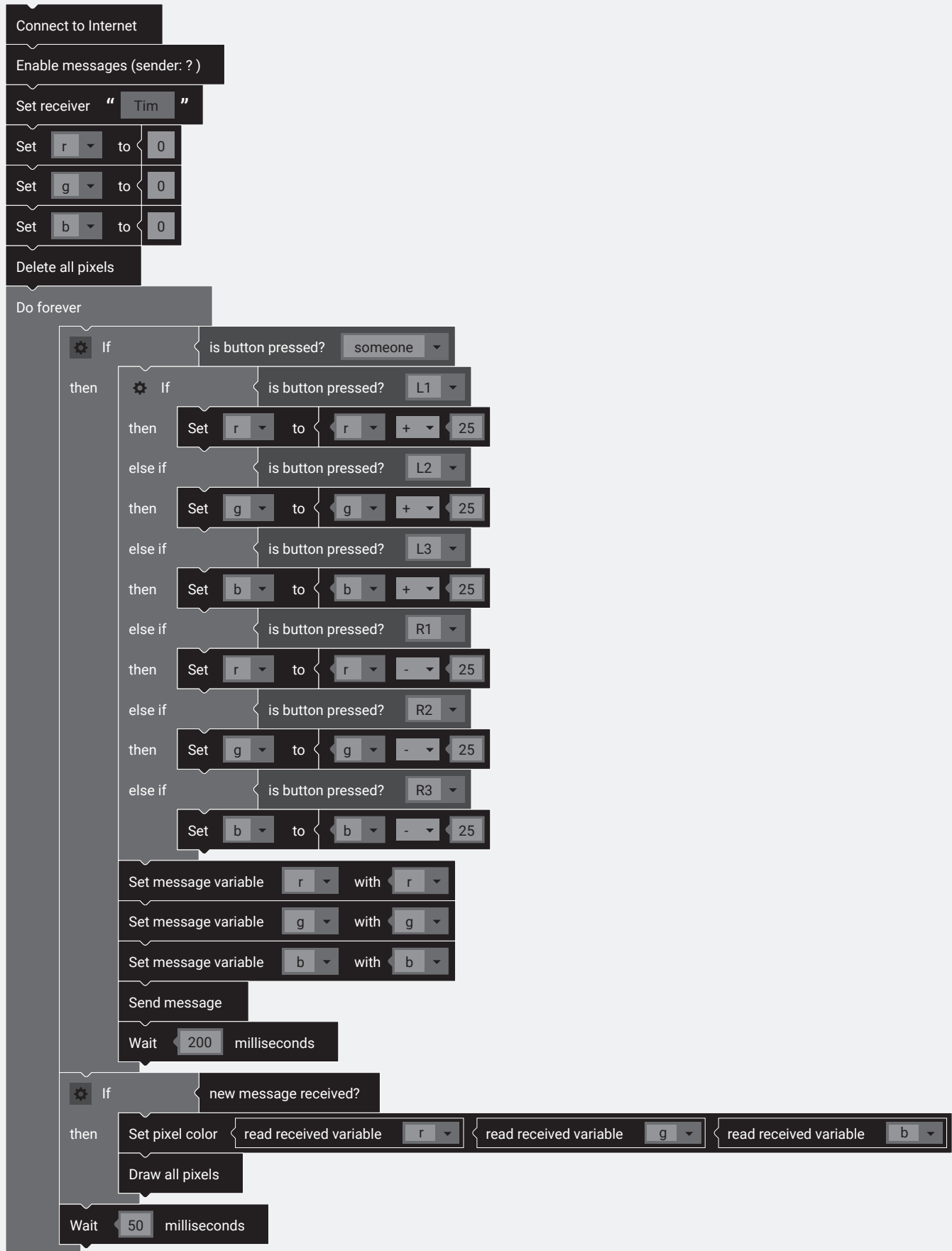
PARTS LIST LIST OF BLOCKS TO BE USED



LEVEL EXPERT

SOLUTION

PROPOSED SOLUTION



WORKSHEET A023

LOCAL COMMUNICATION II

Learning objective:

Capacity to send and receive variables.

WHAT TO DO

1. As with any communication program, the card must first connect to the Internet and enable the sending and receiving of messages.
2. Then the «Set receiver» block must be used to define one (or more) receivers and to initialize the variables.
3. In the «Do forever» loop, the button queries and the query as to whether a new message has arrived are entered.
4. When a button is pressed, a color value is increased or decreased, then the short message variables are set and the message is sent.
5. When a new message has arrived, the variables sent by the sender card should be read and the pixel color set (also possible in one step). Then the pixels have to be drawn.
6. At the end there is a short «Wait» block, which gives the card some time to receive messages.



This is an «Expert-Block» and is only displayed if «Settings» – «Activate the Expert-Mode» is set.

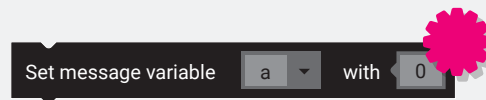
Click on «Settings» in the lower left corner ...



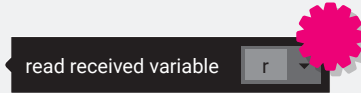
Settings

... and select «Activate the Expert-Mode».

NEW COMMANDS



Sets any value of the selected variable of a direct message.



Reads the value of the selected variable of the received direct message.

ADDITIONAL INFORMATION: ARITHMETIC OVERFLOW

In computer science, one speaks of an arithmetic overflow if the defined value range of a variable is exceeded or undercut. This can be seen in this worksheet if, for example, the red value is set above 255 (or below 0). The observed behavior is that after the maximum value (255) the LED matrix switches off again. In fact, e.g. after 250 already a 275 is sent and received. However, when setting the pixel color the 275 is converted into a 19 (275-256=19) which is too small a value to see anything on the LED matrix.

The reason for this is that the data type used for a pixel color is only one byte, which has a value range from 0 to 255 or allows 256 different values. The same behavior can be observed with the «Play tone (Hertz)» block if you enter a value greater than 65'535. For example, 65'976 corresponds to a frequency of 440 Hz. The defined value range of the frequency was therefore set to 65'976. (2 bytes).