



FAQ# MTN-9J7PMQ

Question:

What is the best method to convert a STRING into a BYTE array and vice versa? Why is this conversion useful?

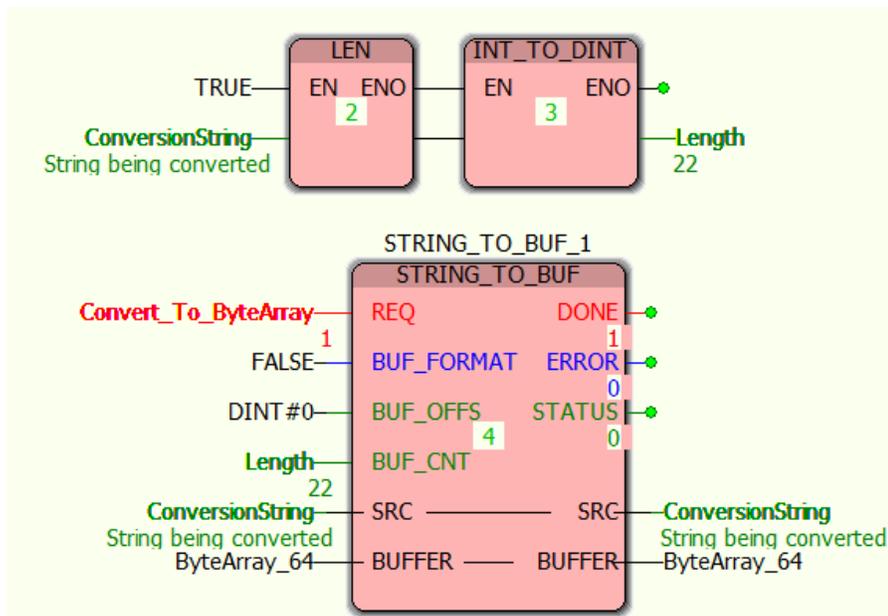
Answer:

Converting a STRING to a BYTE array can be a useful when sending STRINGS to another device via because the internal storage of a STRING on the MPiec Controller contains a four byte header that is unnecessary to transfer, and will likely be misinterpreted by the receiving device as part of the string data.

The first step when converting a STRING to a BYTE array or vice versa is to add the ProConOS firmware library to the MotionWorks IEC project (this library contains the STRING_TO_BUF and BUF_TO_STRING function blocks).

When converting a string to a byte array follow these steps:

1. Create a byte array data type with length equal to or greater than the length of the string being converted. For your convenience, the Yaskawa toolbox includes several byte array data types such as YTB_ByteArray_### where ### is the array size.
2. Insert the STRING_TO_BUF function block into a worksheet.
3. Attach the STRING to the **SRC** VAR_IN_OUT and the BYTE array to the **BUFFER** VAR_IN_OUT.
4. Depending on the hardware of the remote device, endian conversion may be required. This is selected by the **BUF_FORMAT** input. Setting BUF_FORMAT to TRUE will cause the MPiec controller to byte swap the data if necessary.
5. The **BUF_CNT** input determines the number of characters in the string to convert. Use the LEN function to obtain the length of the actual string. An INT_TO_DINT conversion function will be necessary on the input to the STRING_TO_BUF function block.
6. **BUF_OFFS** is the array index (assuming a zero based array) in buffer where the first character of the string will be written. Typically this will be DINT#0.
7. Execute the function block. The **REQ** input functions similarly to the Execute input on PLCopen function blocks and will perform the conversion upon the rising edge.



When converting a byte array to a string:

1. Create a STRING (or STRINGS.) The default length of a STRING data type is 80 characters (bytes).
 Note: The maximum length of a string is 512 characters. Since a BYTE array may be larger than 512, it may be necessary to convert one BYTE array into multiple STRINGS.
2. Insert the BUF_TO_STRING function block into a worksheet.
3. Attach the STRING to the **DST** VAR_IN_OUT and the BYTE array to the **BUFFER** VAR_IN_OUT.
4. If endian conversion is required, set the **BUF_FORMAT** to TRUE. If you are unsure if endian conversion is necessary, set the input to TRUE and the MPiec controller will determine if conversion is necessary.
5. **BUF_CNT** is the number of BYTES to convert to STRING. Ideally the string is a fixed or known length. If the length of the STRING contained in the byte array is unknown, use a loop to determine the number of non-zero elements contained in the byte array.
6. **BUF_OFFS** corresponds to the index in the BYTE array where the first character of the STRING is located.
7. Execute the function block. The **REQ** input functions similarly to the Execute input on PLCopen function blocks and will perform the conversion upon the rising edge.

