



Ockam System Remote Commands

For some time now, the '@' tag has been used for various jobs in the Ockam system. With the advent of the Lynx remote controller, it's time for this under-documented tool to get its own white paper.

Review of Ockam Bus communications

The Ockam bus currently carries 5 channels of information. For this discussion, we'll concentrate on the display (T1) and keyboard (T2) channels. Data on the display channel flows from the processor to displays, while data from displays and RS232 flows to the processor. Every box on the Ockam bus can hear the display channel, and talk on the keyboard channel (provided they're interested in the information of course).

Display channel:

The processor outputs units of information to displays in 'frames'. Each frame begins with a 'tag' designating the type of information. The tag is followed by ASCII data and ends with a null (<0>) character.

Frames follow each other in a continuous stream.

Displays look for a tag matching the data they've been set to receive. In the case of the 005 display (the one with the cards), the tag character is encoded directly in magnets. Newer displays do exactly the same thing although the designation of the tag is less direct.

Keyboard channel:

The processor listens to the keyboard channel for commands to execute. There are a lot of them (see the system manual, section 4), but we'll concentrate on the User Output command which places frames onto the display channel.

A user output command begins with 'U' followed by the tag to be used, followed by '=', then the data and ended with a carriage-return (<cr>) or null. Conventionally, tags '0' thru '9' are designated for user output, but the system doesn't enforce this rule, so 'tag' can be any character.

Example:

B6.38<0> is a frame for Boatspeed. 'B' is the tag and the value is 6.38.

Example:

...B6.38<0>A12.1<0>D-23<0>...
Boatspeed is 6.38, Apparent Wind Speed is 12.1 knots and Apparent Wind Angle is 23 degrees to port.

Example:

Card magnets= 01000010 (ASCII 'B')
Display finds the frame beginning with 'B' and displays the following text, 6.38.

Example:

U3=hello<cr> causes the processor to add 3hello<0> to the display channel stream.
...c233<0>a8.5<0>3hello<0>...
Wind direction 233, True wind speed 8.5 and User 3 of hello.

Remote commands

Remote commands are frames whose tag is '@'. Many boxes (displays and interfaces) on the Ockam Bus monitor for this frame, and if programmed appropriately, respond. The original use was to allow remote control of the Magnum display, originally called the 'Jumbo'. The Matryx display also responds to this command set.

Most of the remote commands include an address field to allow multiple devices of the same type to be differentiated. For the Magnum, the address is set by a rotary switch, while the Matryx, is set by the setup menu. In the case of the Lynx, the address is changed by remote command.

Jumbos (actually Matryx, Magnum and the 005B) listen for frames beginning with '@J' followed by an address (to designate a particular jumbo), and ending with a specific command to change pages, menus, lighting and display comments.

Example:

the frame @J1S+<0> tells jumbo #1 to advance to the next page or menu item.

To put such a frame on the bus, wrap it in the user command syntax.

Example:

U@=J1S+<cr> advances jumbo #1 to the next page or menu item.

Command Reference

Note

In the following examples, the typed command is shown rather than the actual frame the device responds to.

Remote display commands: @Jn...

Matryx and Magnum can be controlled by this remote command as well as by hardware buttons. The address range (*n*) is 1 to 15, or '*' to address all Jumbos. The address is set by a rotary switch or setup menu.

Cmd	Description	Example
Mm	(Magnum only) Set to Menu <i>m</i> .	U@=J1M3
Sm	Set to menu item <i>m</i> (Magnum) or page (Matryx).	U@=J1S3
S+ -	Next Previous page/menu item	U@=J2S+
Ttags	Display <i>tags</i> (Magnum can only have 1 tag; Matryx can have 1-4 tags)	U@=J1TB
Dtext	Display <i>text</i> . Magnum displays on the text line, Matryx displays on a drop-down.	U@=J1DTACK!
Lm	Set local light level to <i>m</i> (0 thru 9). Lighting is the product of the local light level and the system light level as set by Option 9.	U@=J4L6

Lynx remote controller: @Ln...

Lynx is a device for issuing system commands under control of a key fob or hard buttons or both. The primary use of remote commands is to reprogram what each fob button should say. The address range (*n*) is 1 to 16, and there is no '*' address. All Lynx addresses are shipped set to 1, and can be changed with the A command (refer to the Lynx manual).

Cmd	Description	Example
<i>Am</i>	Change Lynx <i>n</i> address to <i>m</i> (1 to 16); must be sent twice in succession. Used to add more Lynx to the same system. After the second command is received, the Lynx address becomes <i>m</i> .	U@=L1A2 U@=L1A2 Lynx1 becomes Lynx2
<i>BmcTag</i>	Send button <i>m</i> command <i>c</i> on Tag. Used to read out current settings.	U@=L1B11x Sends Lynx 1, button 1, command 1 to tag 'x'
<i>CnCmd</i>	Program button <i>n</i> with <i>Cmd</i> . Erases all other commands on that button.	U@=L1C1^T Lynx 1 button 1 now starts the stopwatch.
<i>Cn+Cmd</i>	Append <i>Cmd</i> to button <i>n</i> . Previous command(s) are not erased. Allows setting multiple commands per button.	U@=L1C1+U@=J1Tt Lynx 1 button 1 now also sets Jumbo 1 to display stopwatch.
<i>Dtag</i>	For troubleshooting. When a command is triggered, it is additionally sent as a frame on <i>tag</i> , so you can see what the Lynx is doing. This diagnostic is disabled on power up.	U@=L1Dx
<i>Vtag</i>	Send Lynx version on <i>tag</i> . This is a handy way to see if the Lynx exists.	U@=L1Vx Tag x displays "Lynx 1.00"
<i>Zdur</i>	Quick-flash the LED (and buzzer, if attached) for <i>dur</i> ATUs; (an ATU is about 0.01 seconds).	U@=L1Z10 Lynx 1 light flickers for 1 second.

Software commands: @Os...

Beginning with OckamSoft 4.07, the driver includes an API to allow remote control of software via the Ockam bus. There are 16 'slots' *s*, each with its own API. Racecourse uses slot #1 and Logging uses slot #2. There are 14 other slots available for 3rd party use. The API traps Ockam frames like "@Os..." and stores the command for access by OS4-friendly applications. See the driver header file for details.

These software commands have been implemented for OS4 Racecourse and Logging functions, and respond to the following commands.

Logging

Cmd	Description	Example
L0 1	Turn logging on (1) or off(0).	U@=O2L1 Turns on logging.
<i>Ctext</i>	Insert comment <i>text</i> into log file. Turns log on.	U@=O2CJack helming Turns on the log and enters 'Jack helming' as a comment.

Racecourse

Cmd	Description	Example
N	Switch to next leg.	U@=O1N
P0 1 2	Ping mark; 0=closest, 1=origin, 2=pin	U@=O1P0

Custom interfaces: @Qn...

Custom interfaces (or 'Q' interfaces as they are sometimes called) provide ad-hoc inputs for the system. There can be up to 16 Q interfaces on the system, each assigned to a unique slot. The slot number is usually assigned by a rotary switch on the interface, but sometimes can be hard-coded (as is the case of the hi-res rudder interfaces). New interfaces written after 8/06 may have the capability of additionally responding to this new set of remote commands.

The address used for @Q commands is the slot number. All future Q interfaces will support this basic command.

Cmd	Description	Example
<i>Vtag</i>	Send interface identification on <i>tag</i> .	U@=Q2Vx Interface on slot 2 replies with it's model number on tag x.

099DM1 Stringpot interface with controller capability

This interface was developed to measure and control a hydraulic forward rudder. In the example, the interface has been assigned to slot 2.

Cmd	Description	Example
<i>Pval</i>	Slew to <i>val</i> angle limited by parameters.	U@=Q2P4 Slew the rudder to +4 degrees.
<i>Jval</i>	Jog <i>val</i> from current value.	U@=Q2J-1.5 Jog the rudder 1.5 degrees port.
T	Slew to the same angle on the opposite side.	U@=Q2T Slew to -2.5 degrees.
<i>Lpval</i>	Set parameter <i>p</i> to value <i>val</i> . p='A' sets the timeout limit. p='B' sets the lockout limit. p='C' sets the positive slew limit. p='D' sets the negative slew limit.	U=Q2LA10 Interface will quit trying to slew to the target angle after 10 seconds.
<i>QpTag</i>	Output parameter <i>p</i> on tag <i>Tag</i> .	U=Q2QAx Returns timeout limit on tag x.

Serial interfaces: @Sn...

Serial interfaces e.g. GPS, NMEA depth etc. (Serial n (1..15); '*' addresses all Serial. S0 addresses the serial port of the T1.

Cmd	Description	Example
<i>Dtext</i>	Send <i>text</i> to sensor.	U@=S1D<waypoint setting> Enters a waypoint (if the attached device is a GPS).
<i>Em</i>	Enable function (see particular interface).	U@=S0E3 Enable both NMEA and Ockam data on the T1.