

Server/ Website Communication

The Communication is handled by a WebProvider, which is a central server in a star pattern. This server waits for clients and applies their changes and distributes these changes to all interested clients.

The provided WebProvider listens on port 8089 and is accessed by the Controller which does a protocol upgrade to enable full block data-writing and PHP-instances which provide data for a website or ServerSendEvents(SSE)

The communication protocol is a use-case limited binary protocol which sends a one byte command followed by a one byte datatype byte followed by a specific number of data bytes specified by the command and datatype.

Commands:

Byte	Name	Usage	Data Content
0x01	Set Data	sets a part of specified data or all if in blockmode	2 bytes, index and value (or all values and no index if only one index exists or blockmode is on)
0x02	Request Data	requests specified data	no data
0x03	Enable Stream	request to get updates of specified data	no data
0x04	Disable Stream	request to stop getting updates of specified data	no data
0x05	Response Data	response of a data request	full dataset of given datatype
0x06	Stream Data	update notification of given datatype	full dataset of given datatype
0x07	Switch to 'Block' protocol	switch to blockmode, datatype has to have the same value as validation	no data

Datatypes:

Byte	Name	number of bytes
0x01	Position	NUM_TRAINS = 11
0x02	Destination	NUM_TRAINS = 11
0x03	Cleanup	1
0x04	Randommode	1
0x05	Lamps	NUM_LAMPS = 24
0x06	Schedule(actually Station)	NUM_TRAINS = 11
0x07	Substation	NUM_TRAINS = 11

Running the WebProvider:

go into code/interface

run 'make web'

run './web'

Ideas for a new version:

- Don't use fixed datatypes, instead add a command to create a datatype by name and bytesize, which returns a datatype number, unique for each name, disconnects if size doesn't match with existing.
- Just use a different command to set the full dataset
- don't send updates to a client if the only change was caused by this client (just skip the current client on setting the dirty flag)
- Maybe add a minimum time between updates (prevents SSE and others from being flooded and the website actually crashing by a JavaScript DOS)